Stabilisation operations as complex systems - order and chaos in the interoperability continuum

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"What matters is that it is your library, invested with your intellectual capital, and serves as a garden of the mind to which you can return again and again".

James G. Stavridis (2017)

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Ben Gans
Venray, 21th April 2019

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AHP	Afghan Highway Police
ATF	Air Task Force
ANA	Afghan National Army
ANAP	Afghan National Auxiliary Police
ANP	Afghan National Police
ANSF	Afghan National Security Forces
ASIFU	All Sources Information Fusion Unit
ASR	Act – Sense – Respond
BG	Battle Group
C-BG	Commander Battle Group
CIA	Central Intelligence Agency
CIMIC	Civil-Military Cooperation
CivRep	Civilian Representative
COIN	Counter Insurgency
CPA	Coalition Provincial Authority
C-PRT	Commander Provincial Reconstruction Team
CT	Counter Terrorism
C-TFU	Commander Task Force Uruzgan
DDR	Disarmament, Demobilization and Reintegration
DPKO	Department of Peacekeeping Operations
EU	European Union
DFID	Department for International Development
DoD	Department of Defence
DRC	Democratic Republic of the Congo
EULEX	European Union Rule of Law Mission in Kosovo
FCOM	Force Commander
HELIDET	Helicopter Detachment
HoO	Head of Office
HQ	Headquarters
IDP	Internally Displaced Persons
ICG	International Crisis Group

ICT	Information and Communication Technology
IED	Improvised Explosive Device
IM	Information Management
IO	International Organisation
IS	Information Systems
ISAF	International Security Assistance Force
LSD	Logistical Support Detachment
MA	Military Assistance
MINURCAT	United Nations Mission in the Central African Republic
MINUSMA	Multidimensional Integrated Stabilisation Mission in Mali
MOD	Ministry of Defence
MONUSCO	Mission de l'Organisation des Nations Unies pour la stabilisation en République démocratique du Congo
NATO	North Atlantic Treaty Organisation
NGO	Non-Governmental Organisation
OCB	Organisational Citizenship Behaviour
OCHA	Office for the Coordination of Humanitarian Affairs
OMF	Opposing Military Force
OMLT	Operational Mentoring and Liaison Team
PIC	Peace Implementation Council
PolAd	Political Advisor
PRT	Provincial Reconstruction Team
PSR	Probe – Sense – Respond
RBV	Resource-Based View
RC-S	Regional Command South
SAR	Sense – Analyse – Respond
SCR	Sense – Categorise – Respond
SHQ	Sector Headquarters
SHQ-E	Sector Headquarters East
SHQ-N	Sector Headquarters North
SHQ-W	Sector Headquarters West
SOF	Special Operations Forces
SOLTG	Special Operations Land Task Group

SRSG	Special Representative for the Secretary-General
START	Stabilisation and Reconstruction Task Force
TFU	Task Force Uruzgan
TFU HQ	Task Force Uruzgan Headquarters
TLO	The Liaison Office
TQM	Total Quality Management
UAV	Unmanned Aerial Vehicle
UCP	Uruzgan Campaign Plan
UN	United Nations
UNAMA	United Nations Assistance Mission in Afghanistan
UNAMID	United Nations African Union Hybrid Operation in Darfur
UNMIK	United Nations Mission in Kosovo
UNMIL	United Nations Mission in Liberia
MINUSMA HQ	Multidimensional Integrated Stabilisation Mission in Mali Headquarters
UNOSOM	United Nations Operation in Somalia
UNPROFOR	United Nations Protection Force
UNSC	United Nations Security Council
UK	United Kingdom
US	United States

1

Introduction[1]

"I shall proceed from the simple to the complex. But in war more than in any other subject we must begin by looking at the nature of the whole; for here more than elsewhere the part and the whole must always be thought of together".

- *Carl von Clausewitz (1832)*

1.1 INTRODUCTION

Since the end of the Cold War, most Western governments and International Organisations (IOs) invested heavily in the ability to conduct expeditionary operations that focus on the stabilisation and recovery of post-conflict zones (Brahimi, 2000; Lindley-French et al., 2010; Woollard, 2013; De Coning, 2016; Verweijen, 2017). Examples of post-conflict zones are the Former Yugoslavia, Iraq, Afghanistan and Mali. IOs such as the United Nations (UN), North Atlantic Treaty Organisation (NATO) and European Union (EU) designed a normative framework to respond to the increasingly complex situations that characterise post-conflict zones (Watkin, 2009). This normative framework is better known as stabilisation operations. In its simplest form, stabilisation operations are defined as "military and civilian activities conducted across the spectrum from peace to conflict to establish or maintain order in States and regions" (DoD, 2005, p. 2). Moreover, stabilisation operations are characterised by international efforts to establish an integrated and comprehensive approach between the many military and civilian actors involved (De Coning and Friis, 2011; Egnell, 2013; Ohlson, 2013; Maley and Schmeidl, 2015). According to many scholars and practitioners, the successful integration of IOs, Non-Governmental Organisations (NGOs), host nation governments, local actors both state and non-state as well as the private sector is key to successful stabilisation operations (Dutch Ministry of Defence, 2000; De Coning and Friis, 2011; Zelizer et al., 2013; Lindley-French, 2013; Heinecken, 2013).

Stabilisation operations include (humanitarian) interventions, counterinsurgency operations (COIN) and peacebuilding missions (van der Meer, 2009). Most of the literature on stabilisation operations focuses on post-conflict activities (Pouligny, 2003; Manning, 2008; Howorth, 2013). However, the UN offers a much broader scope of their integrated missions by defining the concept as "aimed at preventing the outbreak, the recurrence or continuation of armed conflict" (Brahimi, 2000, p. 1). Thus, the UN makes a distinction

[1] Parts of this chapter have been presented at the following peer reviewed conference:
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between pre- and post-conflict peacebuilding. To summarise, an integrated or comprehensive approach to stabilisation operations can be applied to the many civilian and military actors involved, across various sectors and levels, aimed at creating peace, security and stability in a certain geographical area, country or region throughout the whole spectrum of conflict.

1.2 A SYSTEMS VIEW OF STABILISATION OPERATIONS

IOs such as NATO, UN and EU as well as Western governments institutionalised the concept of an integrated and comprehensive approach to stabilisation operations (Brahimi, 2000; US Department of Defence, 2005; Lindley-Fench et al., 2010; Woollard, 2013; UK Stabilisation Unit, 2014; Dutch Ministry of Foreign Affairs, 2014). NATO defines the concept as: "the cross-governmental generation and application of security, governance and development services, expertise, structures and resources over time and distance in partnership with host nations, host regions, allied and partner governments and partner institutions, both governmental and non-governmental" (Lindley-French et al., 2010, p. 2). The UN aims to integrate their various agencies (e.g. UNDSS, UNHCR, UN OCHA etc.) underneath a centralised Command & Control (C2) structure which is defined as UN integrated missions (UN IMPP, 2006). This integrated missions design integrates both organisational design as well as processes with the intent to improve planning and coordination. In an official memo, former UN Secretary-General Boutros-Ghali (1997) defines the UN integrated missions as: "an integrated mission is based on a common strategic plan and a shared understanding of the priorities and types of program interventions that need to be undertaken at various stages of the recovery process. Through this integrated process, the UN system seeks to maximise its contribution towards countries emerging from conflict by engaging its different capabilities in a coherent and mutually supportive manner" (p. 61). The EU applies two different definitions to explain their view on an integrated and comprehensive approach. One narrow and one broader definition. The narrow definition is simply defined as civil-military integration (European Council, 2003). The broader definition is defined as "an integrated EU approach towards a third country or towards another region or group of countries. An integrated approach means that the EU has a set of objectives developed by and agreed to by all relevant EU institutions and it then has policies, "tools", and activities to implement these objectives. Both the objectives and the activities may be contained in a strategy towards the country or region in question" (Woollard, 2013, p. 1). The Dutch government appreciates the absolute necessity of a broad and integrated approach throughout the whole spectrum of conflict. In a high-level policy document, they stress that "in many fragile states and conflict situations, state actors cannot or will not provide security and stability to their population. Some form of international intervention is then needed to improve the security situation and living conditions of the people. The recognition that root causes and symptoms require a coherent response from the many actors involved has grown over the last decades. However, we have learned - even painfully – that the political, ethical, socio-economic and security factors are inherently interconnected in

such situations. Therefore, an integrated approach is required" (Ministry of Foreign Affairs of the Netherlands, 2014, p. 3).

Throughout the last decades, stabilisation operations turned out to be structurally complex (Leslie et al., 2008; Lindley-French, 2013; De Coning, 2016), yet Western thinking of their strategic model follows a general and linear structured input-process-output model that should be applicable to different operations (Eriksen, 1996; Ramalingam, 2013; ADDP, 2014; Chandler, 2016). However, one of the primary lessons learned from the interventions in the Former Yugoslavia, Iraq and Afghanistan is that such a general and linear structured input-process-output model is insufficient to represent the complexity of stabilisation operations, since the interactions between the actors involved often show complex and dynamic patterns (Wislow, 2002; Manning, 2003; Rathmell, 2005; Rietjens and Bollen, 2008; Paris, 2009; De Coning, 2016). The first and most obvious complicating factor is the number of actors involved. While actors share the common goal of stabilisation, they often must cope with extreme cultural differences causing daily friction (Bollen, 2002; Abiew, 2003; Soeters et al., 2003; Frerks et al., 2006; Autesserre, 2014; Holmes-Eber, 2016), and behave strategically to maximise their own interests and subscribe to different priorities (Williams, 2011). This can easily lead to opportunistic behaviour. As a result, the number of potential interrelationships, coalitions, issues and conflicts increases exponentially as the number of actors increases. Furthermore, in an environment that is characterised by its uncertainty and ambiguity, actors also develop differences in problem perception, conflicting moral judgments - about right and wrong, and about who is right or wrong - which further deepens the contradictions, conflicts of interest and preferences for particular solutions (Tajfel and Turner, 1979; Boré, 2006; Salmoni and Homes-Eber, 2011; Posey, 2014; Holmes-Eber, 2016; Noll and Rietjens, 2016). This social complexity is boosted by interdependencies, differences in power, knowledge and information levels. Hence, coordination between the many actors and across hierarchies is therefore an important challenge to embrace (De Coning and Friis, 2011; Rietjens et al., 2013; Verweijen, 2017). These inevitable paradoxes can be best explained by the definition of the primary unit of analysis in this study: the organisational system.

Lawrence and Lorsch (1967) define an organisational system as "a system of interrelated behaviours of people who are performing a task that has been differentiated into several distinct sub-systems, each sub-system performing a portion of the task, and the efforts of each being integrated to achieve effective performance of the system" (p. 3). Differentiation explains for "the state of segmentation of the organisational system into sub-systems, each of which tends to develop particular attributes in relation to the requirements posed by its relevant external environment. It includes the behavioural attributes of members of organisational sub-systems" (p. 3). By contrast, integration is "the process of achieving unity of effort among the various sub-systems in the accomplishment of the organisation's task" (p. 4). Reflecting on the above definitions, stabilisation operations require a highly differentiated as well as integrated organisational system with interaction between the actors of their sub-systems. These interactions relate to a broad range of issues, take place under complex conditions, with each interaction following its own pace dictated by its specific conditions. Hence, stabilisation operations can be understood as an organisational

system that is formed around various sub-systems which interact in a non-linear fashion, in turn influencing a system's condition from inside the system's boundary (i.e. influenced by the internal organisation). Interactions in a non-linear fashion are defined as "complex" (Perrow, 1972; Waldrop, 1992; Capra, 1997). Thus, stabilisation operations can be viewed as complex systems. According to systems thinking, a closed system is in a state of being isolated from its environment and operates deterministically, while open systems are characterised by a certain degree of interaction with their environment and operate most probabilistically (Wiener, 1952; Von Bertalanffy, 1968). Stabilisation operations take place in a highly complex environment from which they cannot be isolated, thereby influencing a system's condition from outside the system's boundary (i.e. influenced by the external environment). Accordingly, we study stabilisation operations as complex open systems impacted by both its complex internal organisation and external environment (i.e. environmental conditions).

As we have described above, stabilisation operations are characterised by their non-linearity, yet the logic of an integrated and comprehensive approach is based upon linear thinking (Eriksen, 1996; Ramalingam, 2013; ADDP, 2014; Chandler, 2016). Typically for stabilisation operations such a linear way of thinking is explained through a MEANS – WAYS – ENDS diagram (Gray, 2006). Perrow (1972) defines linearity as "interactions in an expected sequence" (p. 78). In other words, inputs and outputs are expected to be proportional, and interactions are well traceable through clear and predictable cause and effect relationships (Von Bertalanffy, 1968; Prigogine and Stengers, 1984). By this logic, an integrated or comprehensive approach are the WAYS which are achieved by simply applying all the purposeful activities of the participating actors from the various systems (MEANS) into a post-conflict zone without determining its feasibility or desirability in relationship to the desired situation (ENDS) (Gelot and Söderbaum, 2011; Ramalingam and Mitchell, 2014). IOs such as NATO, UN and EU, therefore, tend to find linear solutions to non-linear problems, in an environment which is characterised as highly non-linear. The paradox between the linear logic of a comprehensive approach and the non-linearity of the complex system on the one hand, and between the complex system and its external environment on the other hand, indicates the purpose of this study: offering complex systems thinking as an alternative for the strategic modelling of stabilisation operations and supporting the debate over the extent to which integration is feasible and desirable.

1.3 RESEARCH PROBLEM

Researchers and practitioners focus on strengthening coordination and integration efforts amongst the actors of various sub-systems involved in stabilisation operations (Patrick and Brown, 2007; Schnaubelt, 2009; De Coning and Friis, 2011; Hynek and Marton, 2011; Smith, 2012; Maley and Schmeidl, 2015). This reasoning is based upon linear thought processes in which inputs and outputs are proportional and cause and effect relationships can be mathematically predicted (Von Bertalanffy, 1968; Prigogine and Stengers, 1984; Ramalingam and Mitchell, 2014; Chandler, 2016). However, complexity derived from the environmental conditions influences stabilisation operations in a non-linear fashion resulting in the dynamic

equilibrium conditions of the complex system. Indeed, as demonstrated in this study, the conditions of the systems are highly uncertain and ambiguous. As a result, coordination between the many actors and across hierarchies is therefore an important challenge to embrace (Bollen, 2002; De Coning and Friis, 2011; Rietjens et al., 2013; Verweijen, 2017). Moreover, during stabilisation operations profusion of information circulate by different means amongst the actors involved (Rathmell, 2005; Rietjens et al., 2007; Rietjens and Baudet, 2017). To cope with such uncertainty and ambiguity, complex systems require not only quantity but also quality of information (Galbraith, 1973; Gell-Mann, 1994; Holland, 1995). Additionally, conflicting interests coupled with a form of incentives to mistrust information, add complexity to the dynamic and uncertainty of stabilisation operations (Eriksson, 1996). Congruently, information asymmetry amongst the many actors involved has been identified as the second main challenge to be undertaken (Rietjens et al., 2007; Manning, 2008; De Coning, 2016; Rietjens and De Waard, 2017).

There is little knowledge in regards to the influence of complex systems thinking on the strategic modelling of stabilisation operations. To better control the impact of information asymmetry in such context, this study focuses on gaining an understanding on how concepts and principles operate in theory and practice. Particularly, this study explores how the complexity of the environmental conditions influences stabilisation operations as complex systems. Second, it addresses subsequent influences on a system's required self-organising ability to differentiate and integrate its various sub-systems, their organisational resources and competencies. Third, this study regards the development and adjustment of condition-dependent capabilities as key to reaching a state of dynamic equilibrium while processing, distributing and exchanging information. The aim of this study is both theoretical and practical: offering complex systems thinking as an alternative for the strategic modelling of stabilisation operations and supporting the debate over the extent to which integration is feasible and desirable. This study is embedded in practice, offering a valuable set of narratives and data. Recommendations and conclusions are therefore grounded in both theory and practice.

1.4 RESEARCH OBJECTIVES AND QUESTIONS

This study has two main objectives. We first aim to understand the impact of complexity derived from the environmental conditions on stabilisation operations as complex systems and the subsequent influence on their required self-organising ability to apply differentiation and integration.

Second, we explore the role of information processing as a key organising concept through which the self-organising system differentiates and integrates its sub-systems, resources and competencies into condition-dependent capabilities. Against this background, the main research question in this study is:

How to better cope with the complexity of multi-actor interaction during stabilisation operations, and how does information processing enable this interaction?

While answering the main research question, we also discuss the following sub-questions:

Q1. How do the environmental conditions impact stabilisation operations?

Q2. How do stabilisation operations respond to the complexity derived from environmental conditions?

Q3. How do stabilisation operations differentiate and integrate their sub-systems, organisational resources and competencies into condition-dependent capabilities?

Q4. How do condition-dependent capabilities positively influence the attainment of outcomes?

1.5 RESEARCH JUSTIFICATION

The stabilisation of post-conflict zones remains a topic which is of utmost importance to the world. Although large-scale inter-state conflict has decreased over the last decades, more blurred intra-state or regional conflict has surfaced. These conflicts are characterised by an increasing number of external actors who intervene in order to protect their national interests. This growing number of actors are inherently fragmentised which leads to increasing complexity on the ground. Hence, peacebuilding will remain an important topic on the agenda of the international community and stabilisation operations will remain an important intervention mechanism.

Reflecting on the above, academic contributions to the fields of peacebuilding and post-conflict reconstruction are of high importance. This dissertation aims to contribute to this research agenda by examining the increasing complexity of stabilisation operations. This study contributes both conceptually and empirically to the organisational design of stabilisation operations which deals with the complexity of multi-actor interaction.

1.6 RESEARCH APPROACH

Reflecting on the research objectives and questions, a design-orientated approach with a system perspective of problem-solving together with design evaluation is best suited (Romme, 2003; Van Aken et al., 2009; Soeters et al., 2014). This research approach combines two research methods of solution-orientated research, namely design science (Romme, 2003; Hevner et al., 2004) and case study research (Yin, 2014) as illustrated in figure 1.1.

The aim of designing a conceptual model to cope more effectively with the complexity of multi-actor interaction during stabilisation operations corresponds with the concept of the design and evaluation of artefacts in design science (Romme, 2003; Hevner et al., 2004). Design science aims to create knowledge (i.e. design artefact) that practitioners can apply to gain understanding of real-world problems and their potential solutions (Hevner et al., 2004). The initial conceptual model presented in this study is evaluated in

two real-world situations with the aim to provide practitioners with guidance in regards to the strategic modelling of stabilisation operations. The final conceptual model, as the primary design artefact, will be the main outcome of this study.

We view stabilisation operations as complex systems differentiated into various sub-systems and part of a supra-system. Hence, the unit of analysis is twofold: first, we focus on the multi-actor interaction between the sub-systems of a stabilisation operation (i.e. within a single system). Second, we study the multi-actor interaction between a stabilisation operation and the other systems as part of the greater supra-system.

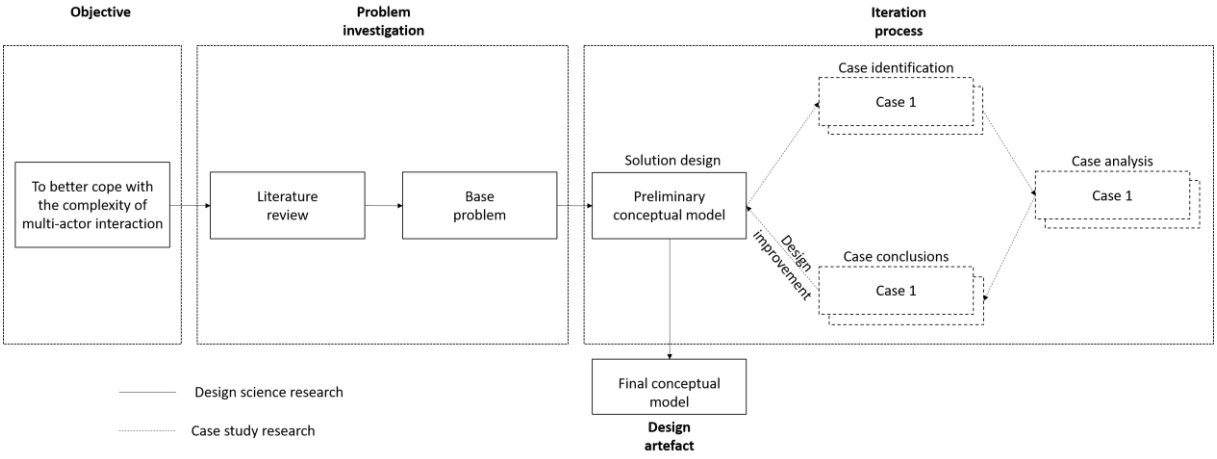

Figure 1.1: Research approach.

As described above, this study combines design science together with case study research. Moreover, since this process is iterative it should be repeated several times. Hence, the evaluation of the design artefact is realised through the application of the initial conceptual model to two case studies. Each case study is considered a single iteration including the analysis of the identified problem, application of the conceptual model to the respective case, generate findings and recommendations for design improvement.

Ultimately, the conceptual model will be finalised and offers complex systems thinking as an alternative for the strategic modelling of stabilisation operations and supports the debate over the extent to which integration is feasible and desirable.

1.7 RESEARCH PROCESS

The research process applied in this study enables us to meet the research objectives and seeks to answer the research questions. It includes the following elements:

- Literature review
- Development of an initial conceptual model and generate preliminary propositions
- Research method

- Data collection and analysis
- Finding conclusions, development of the final conceptual model and generate final propositions

1.7.1 Literature review

Conducting the literature review has two objectives: first, we aim to gain a detailed insight in the main phenomena being studied and offer a detailed description of the constructs, in turn, enabling the development of the conceptual model (Bacharach, 1989). Second, we aim to provide current insights regarding the research topic by delving into the domain of study and adjacent domains. Additionally, we look at the research topic from a historical perspective with the intent of preventing undesirable duplication of effort from previous studies. Moreover, it supports us to relate our own findings to previous studies and to offer an agenda for future research.

To be able to examine how the complexity derived from the environmental conditions influences stabilisation operations as complex systems and their subsequent impact on the development of condition-dependent capabilities, the literature review should offer insights in the following domains of study:

- The complexity derived from the environmental conditions and their influence on a system's condition.
- A system's condition and its accompanied behaviour.
- How complex systems differentiate and integrate their sub-systems, organisational resources and competencies into condition-dependent capabilities.
- Outcomes gained from condition-dependent capabilities.

1.7.2 Development of an initial conceptual model and generate preliminary propositions

The results derived from the literature review allowed us to select the theoretical constructs relevant for this study. The constructs, in turn, serve as foundation for the design of the initial conceptual model. The initial conceptual model aims to shape boundaries for this study by defining the theoretical constructs. Furthermore, the initial conceptual model illustrates the relationships between the constructs by generating preliminary propositions. In short, the initial conceptual model is designed to solve the identified problem and is subsequently evaluated in relationship to the utility provided by the conceptual model as solution to the respected problem.

1.7.3 Research method

This study has an explorative character. Its main objective is to find and better understand the relationships between the phenomena investigated (Soeters and Heeren-Bogers, 2013). The starting point of any research method should be defining a suitable research question (Yin, 2014). Within this research the research question can be categorised as a "how" question. According to Yin (2014), "how" questions can be answered by using experiments, historical analysis and case studies (Yin, 2014). Further analysing the research topic learns that the research focuses on a set of contemporary events that do not require the researcher to control

the environment. That is, the research should be done in a current non-contrived setting. After combining these observations and consulting the Yin-framework, a multiple case study research is a desirable choice for this study.

1.7.4 Data collection and analysis

The initial conceptual model will be applied to two case studies to discover and bridge the challenges identified, to add value to the literature on stabilisation operations and to evaluate the shortcomings of the model itself. Data is collected from two case studies and analysed accordingly. The first case study describes the Task Force Uruzgan (TFU) mission in Afghanistan. This case represents the first iteration of the conceptual model by providing feedback on the problem and its potential solution to a 'real world' situation (Simon, 1996). This process can be viewed of as circular and should be repeated several times in order to enable the development of the final model (Markus et al., 2002). Therefore, the second case study, the United Nations Multidimensional Integrated Stabilisation Mission in Mali (UN MINUSMA), elaborates on the first case study by presenting a second iteration of the conceptual model which aims to offer a more detailed insight in the respected problem. Finally, we presented the conceptual model to 5 senior members of the Ministry of Defence and Ministry of Foreign Affairs of the Netherlands. One could consider this an *ex-post* analysis of the conceptual model to provide the final information feedback over both the model itself as well as the process for explanation building.

From a theoretical point of view, this research aims to enhance the theoretical understanding of stabilisation operations as complex systems, and offer a conceptualisation which introduces complex systems thinking as an alternative for the strategic modelling of stabilisation operations to cope more effectively with the complexity of multi-actor interaction. From a practical perspective, the actors involved in stabilisation operations can utilise the insights derived from this study to determine how the complexity derived from the environmental conditions impact the predictability of stabilisation operations as complex systems. More importantly, the actors involved can use these determinations to better understand how a system's condition impacts its required self-organising ability to differentiate and integrate its sub-systems, their organisational resources and competencies. The in-depth analysis provides an understanding on how differentiation and integration enables the development of condition-dependent capabilities. Thus, interesting insights on how stabilisation operations apply C2 and information processing to conduct their daily operations and counteract the various disturbances which might cause them to deviate from those tasks. In sum, the outcomes of this study provide new insights for both academics and practitioners offering complex systems thinking as an alternative for the strategic modelling of stabilisation operations and supporting the debate over the extent to which integration is feasible and desirable.

1.7.5 Phase 5 – Assessment of conclusions and generate design guidelines

In the final phase of this study the conclusions are presented and discussed. This will be done by presenting the key results of this study which are applicable to both theory and practice. Additionally, we present the final conceptual model, generate design guidelines and make recommendations for future research.

1.8 READING GUIDE

The remainder of this study is organised as follows. In chapter 2 we present a literature review of stabilisation operations, systems thinking, strategic management theory and information processing theory. This is followed in chapter 3 by the introduction of the initial conceptual model. The research method is presented in chapter 4. In chapter 5 and 6, the initial conceptual model is applied to the first case study: the Task Force Uruzgan (TFU) mission in Afghanistan, and subsequently the second case study: the UN Multidimensional Integrated Stabilisation Mission in Mali (UN MINUSMA). What follows are the cross-case analysis and development of the final conceptual model which are presented in chapter 7 and 8 respectively. We finalise this dissertation in chapter 9 with discussing the contributions, limitations and conclusions of this study. Figure 1.2 visualises the outline of this study

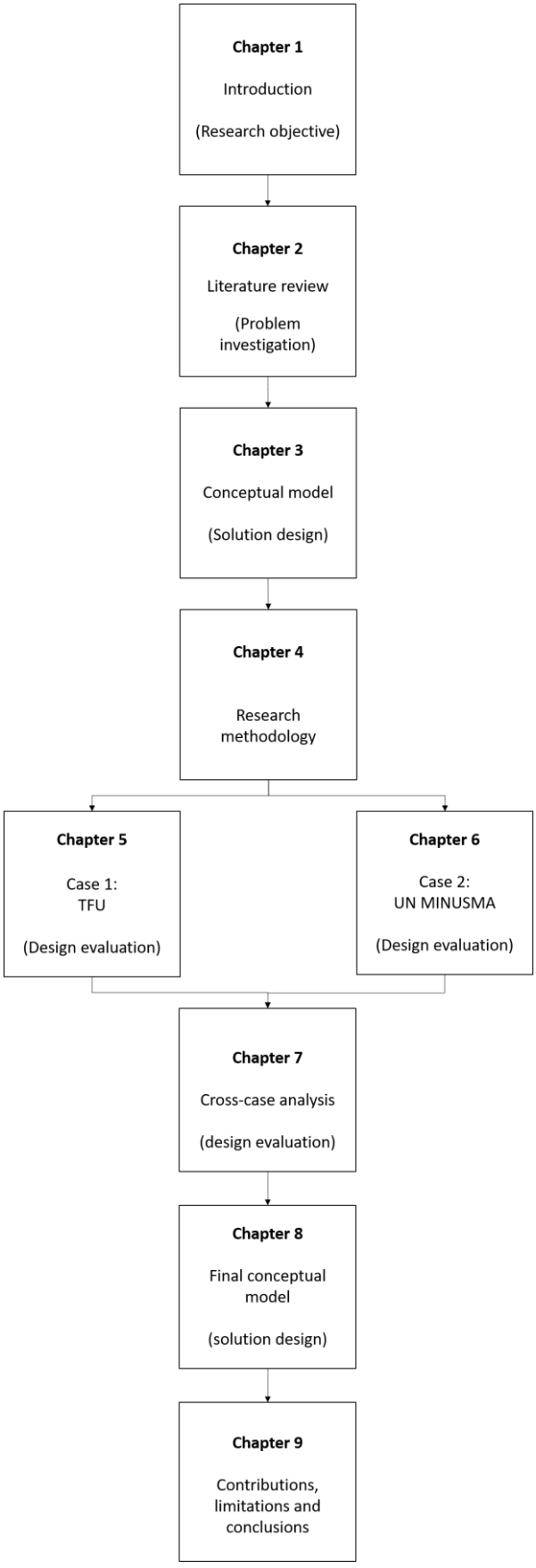

Figure 1.2: Outline of dissertation.

2

Literature review[2]

"Today the network of relationships linking the human race to itself and to the rest of the biosphere is so complex that all aspects affect all others to an extraordinary degree. Someone should be studying the whole system, however crudely that has to be done, because no gluing together of partial studies of a complex nonlinear system can give a good idea of the behaviour of the whole".

- *Murray Gell-Mann (1994)*

2.1 INTRODUCTION

In this chapter, we first present a general overview of the literature on stabilisation operations to provide some background against the domain of study. What follows is the presentation of the literature on multi-actor interaction from an organisation theory perspective since we believe the literature on organisational design and organisational structure, relationships between organisations and their external environment, and the behaviour of the actors within organisations is highly relevant for stabilisation operations. Finally, we connect both parts to illustrate the connection between both domains

What follows is the review of the literature on systems thinking. This literature is used to describe the connection between complex systems thinking and stabilisation operations, thereby illustrating the proposed alternative for the strategic modelling of stabilisation operations. To have a better understanding of how complex systems use information processing as the key operating process through which they adapt and self-organise their organisational resources, we will delve deeper into the literature on information processing, distribution and exchange. Finally, to better understand the relationship between stabilisation operations as complex systems and the outcomes produced, we present the literature on strategic management theory to illustrate that a complex system can be viewed as an organisational resource or a collection of organisational resources.

The findings of this literature review serve as the foundation for the development of the initial conceptual model which is described in the next chapter.

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2.2 STABILISATION OPERATIONS

This section outlines the key sectors of stabilisation operations, namely security, development and governance (Ramsbotham et al., 2005; Manning, 2008; De Coning and Friis, 2011; Egnell, 2013; Neuteboom and Soeters, 2017). Security is concerned with actors conducting tasks related to physical security (e.g. protection of civilians as well as critical infrastructure), human security (e.g. protection of refugees, Internally Displaced People and human rights) and tasks such as capacity building and Rule of Law (Feigenbaum et al, 2013).

The development sector is focused on social and economic domains. The social domain includes providing basic needs to local communities, refugees and IDPs. This type of aid is also known as humanitarian support. Economic development relates to sustainable trade and investments as well as micro finance projects (Wisler and Onwudiwe, 2007; Verweijen, 2017). Finally, the development sector includes also the Disarmament, Demobilization and Reintegration (DDR) of former members of armed groups into the civil society (Weinberger, 2002; Egnell, 2013).

Governance refers to the ability of a government to offer basic services to their population. It includes political processes such as free and fair elections, constitution building but also elements of good governance such as anti-corruption and free press (Zelizer, 2013).

2.2.1 Introduction to the sectors

Security. In the military, the establishment of a clear and single chain of command is critical in the design and of any military operation (Weinberger, 2002; Vogelaar and Kramer, 2004; Kramer, 2007; Olsthoorn and Soeters, 2016). Multiple military operations which are in place simultaneously can each have their own mandate and mission. This can generate friction between the military commanders themselves but more importantly, it can create friction between coalition and the (temporary) political settlement in the conflict area (Leslie et al., 2008). This was particularly the case in Afghanistan when two different types of missions were being conducted simultaneously (Guo and Augier, 2013). In this case, the United States (US) mission Operation Enduring Freedom (OEF) was focused on Counter Terrorism (CT) while the ISAF mission focused on post-conflict reconstruction. As a result, potential troop contributors to the ISAF mission were anxious because they had concerns regarding an unexpected evacuation of their staff members in case the security situation deteriorated (Weinberger, 2002; Manning, 2008; Williams, 2011).

According to Pirnie (1998) the unity of command becomes even more important in the case of a comprehensive approach. First, clear nominally distinct areas of responsibility have to be defined. According to Rathmell (2005) difficulties arose in the Iraqi case as the "civilian leadership only sporadically acknowledged the causal linkages between security and other policy areas such as political and economic reforms. The military leadership, meanwhile, did not do a good job of conceptualising the campaign as an integrated political-military effort, sometimes failing to put tactical military operations in the broader political context" (p. 1031). This friction can mainly be addressed to a lack of collaborative governance at

all levels of the mission (Pirnie, 1998; Vogelaar and Kramer, 2004; Soeters, 2008; Olsthoorn and Soeters, 2016).

When it comes to mission planning there is continues debate about the organisation of security forces. Some argue that a large international rapid response force is key for the stabilisation of conflicts. Others will say that working side-by-side with indigenous security forces is key for establishing and maintaining security and rule of law. This latter is also known as Military Assistance (MA). MA is a long-term investment and focusses on the strengthening of the local government (Oakley et al., 1998): "the local government is typically characterised by an extremely weak or dysfunctional domestic law enforcement apparatus; … [leading to the] incapacity of the host government to provide public order, especially when measured against international standards for policing and human rights. This void in institutional capacity can be bridged by effective use of international civilian trainers and mentors. This process tends to begin while the military contingent is still present, but it ought to continue well after their departure…" (p. 11-15). The training of an indigenous army and police force is closely connected to the process of DDR of former combatants. During the ISAF mission in Afghanistan UN Special Envoy for Afghanistan and Chairperson of the Bonn Conference Brahimi stated that he hoped that "the international community would help those who had participated in Afghanistan's many wars to return to civilian life in dignity" (United Nations, 2002, p. 3). Ultimately, there was no specific program for the DDR of former combatants in the Bonn accords (Weinberger, 2002).

Development. The delivery of aid and assistance into conflicts cannot be done without some support of the security sector. Even the most basic services to support a local community, such as the delivery of food, water and medical aid cannot be done in an environment where the security situation is still fragile (UN, 2014). Previous experiences of stabilisation operations with a sole focus on humanitarian objectives have been proved to be unsuccessful. The UN mission's in Somalia (UNOSOM) primary goal was to provide food security to the population of Somalia which was affected by famine. This mission became a failure after the United States withdrew their forces after the failed raid by its special operations units (Hirsch and Oakley, 1998). Another example of a failed mission with humanitarian goals is the UNPROFOR mission in the former Yugoslavia. The main goal of this mission was the protection of civilians, provide food and medicine to suffering communities throughout the conflict affected country (Betts, 1994). Serbian troops repeatedly obstructed the delivery of aid by UN forces. Due to the humanitarian mandate of the mission and the neutral position of the UN they were not capable to stop the Serbian forces.

In the aftermath of September 11th, American forces started a CT campaign in Afghanistan. The previous years of civil war and the hard Taliban regime made the Afghan population pay an inevitable toll. The UN and multiple NGOs tried to provide aid (e.g. water, food, medicine) to Afghan population. The lack of sufficient and well-trained security forces in the country could not provide the aid workers with proper security, let alone the Afghan public (Weinberger, 2002). According to Rathmell (2005) in the Iraqi case "the collapse of the security sector was a microcosm of the wider paralysis of Iraqi governance at all levels" (p.

1024). The power and authority in the Saddam regime was too centralised for subordinates to take over and start with the organisation of security. This reality meant that providing humanitarian aid was far more complex and challenging then was initially planned for (Rathmell, 2005).

Most of the international donors for providing aid are focused on long-term needs. These long-term needs require thorough planning and coordination and therefore require a lot of critical time. Conflicts are highly vulnerable to demographic pressures such as lack of water, food and high numbers of refugees. These threats require the rapid deployment of humanitarian aid. The International Crisis Group (2008) made an initial assessment for the Afghanistan case and made the following recommendations: "to get assistance moving as rapidly as possible - trusted partners - those NGOs already operating in the country… should be the court of first resort…. Most donors appear to recognise that a province-by-province, and perhaps even a village-by-village, approach will be needed…. Afghanistan needs to be built from the ground up" (p. 3-5). The International Crisis Group also stressed that it was favourable to distribute aid in a small, flexible and decentralised way. An important role here as actors had to be played by local communities (Weinberger, 2002).

The security situation in conflict affected areas is playing a decisive role whether humanitarian aid can be distributed rapid and easily or not. The recommended concept of distributing aid, made by the ICG, was successful in promoting recovery in East-Timor (Weinberger, 2002). In countries such as Iraq and Afghanistan, the immense security threats made such a concept impossible and requires interaction between actors from the security and development dimension. The risk of failure is considerable since multiple actors are involved, holding different, often competing interests and perspectives on problems and solutions.

A key challenge in stabilisation operations is the planning and management of the deployment of international resources (Rietjens et al., 2013; De Coning, 2016). Indeed, according to Eide et al. (2005): "while there is a tendency to blame the limited success rate on lack of resources, it is equally possible that the main problem is more related to a lack of coherent application of the resources already available" (p. 5). In the Iraqi case, processes such as planning, coordination and resource management were never effectively integrated (Rathmell, 2005). Additionally, the lack of coherence between resource allocation and a mission's mandate was also stressed by Brahimi (2000) in his report on UN Peacekeeping Operations.

Governance. An explicit link can be made between reconstruction and the construction of democratic states (Boutros-Ghali, 1997). Therefore "International intervention must extend beyond military and humanitarian tasks and must include the promotion of national reconciliation and the re-establishment of effective government" (p. 9). Boutros-Ghali (1997) describes effective government in conflicts as democracy: "there is an obvious connection between democratic practices – such as the rule of law and transparency in decision-making – and the achievement of true peace and security in any new and stable political order. These elements of good governance need to be promoted at all levels of international and national political communities" (p. 62). Effective state building includes the elements of authority, legitimacy and capacity and needs to be conducted at all levels (i.e. national, provincial and local) in order to establish

an integrated government which is capable to reach out to the whole of society (Manning, 2008). The state here is being defined as "an organisation or set of organisations with the authority to make and enforce the definitive rules for a given society, using force if necessary" (p. 29). We can speak off an effective state when the government can offer basic services to its citizens, is capable of organising free and fair elections and includes a democratically elected parliament. Furthermore, DDR needs to be effective while rebuilding basic facilities, transportation and communications networks, building educational and health infrastructure and providing employment and community life at the local level.

Policy for state building is being established on the national level. The national level commonly exists of few political elites or diaspora. First, this small group of people are typically working closely together with the multinational organisation in order to develop policy, rules and structures. Second, public support need to be found through elections and finally this needs to be extended to the provincial and local level. According to Gunther et al. (1996) "democracies become consolidated only when elite consensus on procedures is coupled with extensive mass participation in elections and other institutional processes" (p. 145). The greatest challenges for this process can be found on the local level (Manning, 2008; Hilhorst, 2008; Auteserre, 2014; Verweijen, 2017). Causes and effects of the civil war are here most visible since reconstruction mechanisms such as resettlement of IDPs, DDR and proving basic rights and services for citizens create potential risks for instability (Manning, 2008; Mustafa et al., 2016).

The practicing of the political settlement at all levels of government throughout the country is highly complex. According to Migdal et al (1994) "the cacophony of sounds from the widely different arenas in which components of the state and social forces interact often have resulted in state actions that bear little resemblance to the original schemes or policies conceived by leaders of the state or by particular state agencies" (p. 17). The translation of centrally-negotiated peace accords into practice is concerned with the complexity of processes such as collaboration between local and central government officials, leadership of political parties, international actors and NGOs.

State building is an element which must run parallel with long-term reconstruction. It is during the employment of these activities where root causes of conflict can be addressed. This requires a thorough comprehensive reconstruction and development program combined with true commitment from the international community (Weinberger, 2002; Paris, 2009; De Coning, 2016). Such a program consists of sufficient financial resources, infrastructure development, health care, human resources, gender empowerment and education. Before starting with long-term reconstruction activities, the international community has to wonder about the willingness for long-term commitment. Long-term economic and social projects which will be unfulfilled can create social unrest and therefore instability (Weinberger, 2002; Zelizer et al., 2013).

2.2.2 Motives for collaboration

In multi-actor environments, the many actors involved all have different motives for committing themselves to collaborate. Generally speaking there are so called "push" and "pull" motives which be divided in three main categories: instrumental, relational and moral motives.

Instrumental motives. There are instrumental models which posit that humans are searching for control (Tyler, 1987). The sense of control can maximise the favourability of the outcomes (Aguilera et al., 2007; Brocades, 2008; Oloruntoba and Gray, 2009). Organisations have several instrumental motives to collaborate with other organisations.

- Efficiency: by joining and coordinating between the deployment of organisational resources and activities, organisations can be more cost-effective.
- Consistency: is another important instrumental motive for organisations to seek for collaboration. Especially within the perspective of post-conflict reconstruction, the many actors involved recognise the importance of having "shared awareness" of their operational environment.
- Legitimacy: by collaborating with others there will be a higher level of legitimacy. More actors working together will increase the political and moral legitimacy.
- Urgency: most Western IOs do not have endless time to participate in stabilisation operations. Time always has been a critical factor. Especially in relation to the level of progress that have been made. Nowadays when most Western organisations also face financial recession in their home country the sense of urgency becomes even more important. Creating a unity of effort, the many actors involved can send integrated reports back to their home country. This is an essential aspect in providing the domestic tax-payers with information and important property of the expected return.

Relational motives. These motives are concerned with the quality of the relationships between actors which can be displayed on the individual level vs. organisational level or citizen level vs. government level. These motives have a strong linkage to the psychological need for belongingness. This is part of the field of organisational justice which is often seen as a catalyst for enhancing social cohesion. Injustice, by contrast, refers to social exclusion (Aguilera et al., 2007; Rietjens, 2008). This dynamic is where self-identity is drawn from (Tajfel & Turner, 1979).

Social cohesion means that "cohesive society works towards the well-being of all its members, fights exclusion and marginalization, creates a sense of belonging, promotes trust, and offers its members the opportunity of upward mobility. While the notion of 'social cohesion' is often used with different meanings, its constituent elements include concerns about social inclusion, social capital and social mobility" (OECD, 2011, p. 7). Social exclusion is defined as "a low level of welfare i.e., economic disadvantage and the inability to participate in social life i.e. socio-political disadvantage (Berger-Schmitt, 2000, p. 24). This indicates that social exclusion refers a certain result or outcome. According to Berghman (1998), social exclusion includes:

- "The democratic and legal system which promotes civic integration.
- The labour market which promotes economic integration;

- The welfare state system which promotes what may be called social integration;
- The family and community system which promotes interpersonal integration" (p. 258 – 259).

In situations where a government ignores the debate between social cohesion and exclusion the risk of social instability rises. (Room, 1995; Haan de, 1999). In many conflict affected countries, the government is not willing or not capable to provide basic services to its people. These core functions are generally linked with citizenship rights. This relationship is therefore equal to a multidimensional notion to poverty which can be caused by state failure (Gaudier, 1993).

Another influential element that is concerned with the quality of the relationships between actors social capital. According to the Social Capital Initiative (1998) "the social capital of a society includes the institutions, the attitudes and values that govern interactions among people and contribute to economic and social development" (p. 1). Most studies concluded that social capital cannot be used to address a single person, it is the property of a social entity. The concept is drawn from a relational perspective and is only valid when it is shared by a number of individuals. From this perspective, social capital is a property of a community instead of the individual (Grootaert, 1998; Immerfall, 1999; Narayan, 1999). Immerfall (1999) conceptualises three distinct levels of social capital, namely:

1. "The level of interpersonal relations, such as family, friends and neighbours.
2. The level of intermediary associations and organisations, such as clubs, firms and political parties.
3. The macro-level of societal institutions" (p. 121 – 122).

Moreover, social capital may also serve as an indicator that determines the state of wealth of a nation and it is a reliable indicator for determining economic growth and other capital such as physical, human and environmental (Jenson, 1998; Grootaert, 1998; Wiman, 1999).

Morality-based motives. Morality-based motives are related to the need for meaningful existence. This psychological need refers to the common idea that most humans are sharing basic respect and human dignity towards each other (Aguilera, 2007). The need for meaningful existence is a sense or feeling that individuals have towards their fellow human beings but also towards organisations. Interesting aspect of this morality-based motive is the difference between an individual's self-interest, group standing or an individual's opinion of ethical appropriateness (Cropanzano et al., 2003). Previous research indicated that individuals have a sense for fairness, even when self-interest or economic benefit is involved. This indicates that moral-virtue plays and important role in this psychological process (Kahneman et al., 1986; Folger, 1998; Cropanzano, et al., 2001; Turillo, et al., 2002). From an organisational perspective this indicates that employees are demonstrating a higher level of Organisational Citizenship Behaviour (OCB). More importantly, it is possible that when an organisation demonstrates a high level of ethical and moral management, employees will prefer morality-based motives above relational or even instrumental motives (Folger and Cropanzano, 2001; Rietjens, 2008; UN OCHA, 2015). This could mean that employees who demonstrate a higher level of OCB also are motivated to contribute to the society as a whole. This assumption is supported by Barbian

(2001) who showed that generally people are willing to downsize personal benefit when their organisation is social responsible.

2.2.3 Framing multi-actor collaboration

The level of collaboration between different organisations differs. First there are differences between the many actors involved. Generally speaking we find higher level of collaboration within governmental, non-governmental or business actors than between them. Secondly differences can be identified at the organisational level. De Coning and Friis (2011) developed a framework (see table 1) for analysing collaboration between the many actors involved. They identified six types of relationships (e.g. unity, integration, cooperation, coordination, coexistence and competition) and four levels (intra-agency, whole-of-government, inter-agency and internal-external) of collaboration (De Coning and Friis, 2011).

Table 2.1: Collaboration matrix. Source: adapted from De Coning and Friis (2011).

	Intra-agency	**Whole-of-government**	**Inter-agency**	**Internal-external**
Unity	Various sections of the Swedish Foreign Ministry	Various Canadian government agencies	Members of the Coalition Operation Desert Storm, 1991 Gulf War	International agencies and national IEC work together to organize elections in DRC in 2006
Integration	Various components of a UN Peacekeeping mission	UK Stabilisation Unit, or Canadian Stabilization and Reconstruction Task Force	UN Peacekeeping mission and UN Country Team in, e.g. Liberia, 2009	Liberia 2009: International agencies and local actors agree to use PRS as common framework and action plan
Cooperation	DPKO and OCHA (both UN Secretariat) work together on UN Protection of Civilians guidelines	Civilian and military pillars of USA PRT in Afghanistan, 2009	Afghanistan Bonn-process 2003; UN-EU cooperation in Chad, 2008	EULEX and the Kosovo government, 2009
Coordination	DPKO and OCHA in the field	Civilian and military pillars of Norwegian PRT in Afghanistan, 2009	Humanitarian cluster approach to coordination; Kosovo UNMIK pillars; Bosnia Peace Implementation Council (PIC)	UN and Sudanese Independent Electoral Commission in April 2010 elections
Coexistence	Various parts of EU in Chad in 2008	DFID and MOD fail to agree on common evaluation criteria for UK PRT in Afghanistan, 2008	Humanitarian community and MONUC in Eastern DRC, 2009	UNAMID and Government of Sudan in Darfur, 2008
Competition	Various sections of a ministry compete	US State Department, US Department of	Humanitarian agencies and UNMIL disagree on	Taliban and ISAF/UNAMA; Government of

	for funding	Defence and CIA in Afghanistan, 2007	movement of IDPs from Monrovia, 2005	Chad and MINURCAT, 2010

Unity. The level of unity within organisational collaboration means that (international) organisations are agreeing voluntarily to the formation of a unified structured organisational design (e.g. multi-national coalition). This type of organisation is under centralised combined joint leadership. Each participating actor deploys its resources under the leadership of the unified structure. This level of collaboration requires a combined joint strategic vision with implied (specific) goals, desired effects and objectives, e.g. targets. These targets are often formulated in an official campaign plan, including desired effects and/or end-state. This requires centralised type of leadership, joint planning, implementation, monitoring and evaluation of operational processes. This level of collaboration between organisations is rare. They occur only under very specific circumstances and are of limited time span.

Integration. Organisations are integrated when they integrate the deployment of their organisational resources and activities without the loss of individual entities and right for independent decision-making. At this level of collaboration there can be joint planning, monitoring and evaluation. The implementation is being done separately and each organisation uses its own resources. The UN uses the level of integration for the collaboration with partner organisations.

Cooperation. Organisations are complementing the deployment of their organisational resources and activities. They also can have overlapping mandates allowing them to operate jointly. This is especially useful when certain organisational resources are scarce. This type of collaboration can often be found with a single action and/or operation.

Coordination. Coordination between organisations intents to prevent conflict or friction between the deployment of organisational resources and activities. Coordination mostly consists of sharing information with partner organisations with "deconfliction" as primary aim. This level of collaboration leaves the most space for an organisation to operate independently and participate on a voluntary basis.

Coexistence. When organisations are forced to collaborate with each other we speak of coexistence. The fact they are forced to collaborate will not mean that they are doing that out of interest. In fact, they mostly have minimum interest in the coordination of the deployment of their organisational resources and activities.

Competition. The last level of collaboration is competition. This will occur when organisations have visions, strategies or values that are opposite to each other. The level of collaboration between organisations is not necessarily one particular level. It is possible that there will be an overlap of two or even multiple levels. This depends primarily on the organisational level of analysis.

The collaboration matrix describes four types of organisational collaboration.

Intra-agency. Collaboration within an individual organisation or entity. This means that there has to be some form of consistency within a specific policy or program.

Whole-of-government-approach. When there is consistency between different national government departments we speak of whole-of-government.

Inter-organisational. Uniformity among the policies and activities of multi-disciplinary and multi-national organisations is described as inter-organisational collaboration.

Internal-external. The last type of organisational collaboration is internal-external. This means that there is consistency between international and local actors.

The framework can be useful when mapping the different forms of collaboration during conflict management. Furthermore, it shows that contemporary stabilisation operations have a multilevel and multidisciplinary character and includes a broad range of organisations and activities (Brzoska, 2006; Ayub & Kouvo, 2008; Davids, 2011). The framework is an instrument which describes the different structures among organisations interacting with each other. It has no normative function and therefore cannot be used for measurement purposes.

2.2.4 Factors for success and failure

As indicated in the above section, the many actors operating in security, development and governance are expected to think and act in more multidisciplinary (i.e. governance, rule of law, economics and security assistance) and multi-actor (i.e. local, international, governmental and non-governmental) integrated ways. In order to improve interaction various obstacles need to be taken. The main obstacles include a lack of credible commitment, knowledge problem, political economy, bureaucracy, business economy, institutional factors, organisational cultural factors and environmental factors (Weinberger, 2002; Bollen, 2002; Rathmell, 2005; Manning, 2008; Rietjens, 2013 De Coning, 2016; Verweijen, 2017)..

A lack of credible commitment relates to the desire for credible commitment in regards to economic reforms. Such reforms typically require long-term stable behaviour. However, reconstruction efforts in general require stable behaviour. Unfortunately, many actors involved in stabilisation operations (and particularly those employed by governmental actors) are driven by continuous change in behaviour which, in turn, leads to contradictories (Acemoglu and Robinson, 2002; Bollen, 2002; Abiew, 2003; Soeters et al., 2003; Frerks et al., 2006; Holmes-Eber, 2016). Ultimately, time inconsistency of reforms leads to regime uncertainty and therefore an increased risk of conflict (Tajfel and Turner, 1979; Boré, 2006; Salmoni and Homes-Eber, 2011; Coyne and Pellillo, 2011; Posey, 2014; Holmes-Eber, 2016; Noll and Rietjens, 2016). The lack of credible commitment is understood as an important factor of failure for economic reconstruction (Boettke and Coyne, 2009; Flores & Nooruddin, 2009; Autesserre, 2014).

According to Coyne & Pellillo (2011) a lack of credible commitment in the Iraqi and Afghanistan cases was born out of "the complexity caused by the interactions of multiple reformers (e.g., U.S. military officials,

Afghan national government officials, aid organisation officials, local warlords, etc.), some of which may perceive that they must change their strategies given new developments or have competing objectives" (p. 629-630). Filkens (2009) describes an excellent example of how a lack of credible commitment can influence the relationship between home and host country officials. The situation took place in Afghanistan where the former commander of ISAF, General McChrystal, was visiting Abdullah Jan, the governor of Garmsir. During their meeting Abdullah Jan told General McChrystal that: "Everyone in Garmsir sees that you are living in tents, and they know that you are going to be leaving soon. You need to build something permanent – a building. Because your job here is going to take years. Only then will people be persuaded that you are going to stay" (p. 18). This example perfectly illustrates the importance of being credible committed to the long-term reconstruction policy and including tasks.

The knowledge problem is presenting the argument that development activities are conducted by two distinct type of actors. Easterly et al. (2006) describes the group of 'planners' who are administratively planning reconstruction efforts from behind a desk, usually far away from the actual field. Second, there are the 'searchers' who are operating in the field and use ground-truth knowledge and understanding to work on social- and economic development projects. Historical cases show that planner-led efforts as the main effort leads to failure (Coyne & Pellillo, 2011; Shetler-Jones, 2016).

Especially in countries such as Afghanistan and Pakistan the need to exploit the knowledge of the local actors both state and non-state are key success factors (Mortenson & Relin, 2006; Salmoni and Holmes-Eber, 2011; Holmes-Eber, 2016). Large centralised development programs also address the knowledge problem (Olsthoorn and Soeters, 2016). According to Pritchett and Woolcock (2004) "valuable local 'practices' – idiosyncratic knowledge of variables are crucial to the welfare of the poor (e.g., soil conditions, weather patterns, water flows) – get squeezed out, even lost completely, in large centralised development programs" (p. 197). Therefore development efforts need to address the local level and have to make use of indigenous drivers.

The local actors such as individuals, households and businesses are the key element in the economic reconstruction of a conflict affected area. They need to have the motivation to be engaged in social- and economic development activities. International actors are there to advice, assist and support. The type of economic activities they can deploy (and thus provided by international MEANS) are depending on their particular circumstances and geographical location.

In order to give full support to the notion of the indigenous drivers, we need to understand historical context of the operating environment including the highly valuable insights of the local actors. The acknowledgment of this understanding was made by the President of Liberia (UNDP, 2010) by stating: "In the case of Liberia where we have had over 15 years of war and before that some other 10–15 years of intermittent violence, one cannot ignore the mechanisms and institutions that helped people survive.… Clearly ordinary people had some capabilities of their own, even if they were residual. Villages were plundered; young boys went in

and burned down villages, killing a lot of people, but some people as a whole community survived. What did they do? My idea basically is that we need to understand these internal capabilities" (p. 14 - 15).

Reconstruction efforts and international support require a certain level of understanding of the socio-historical context (Ohiorhenuan and Stewart, 2008; Rietjens, 2016). To have a full understanding of the socio-historic context we need to focus on the local level. Although engaging in local level reconstruction activities require more preparation time, a historical view on reconstruction efforts explains that focusing on the local level is more likely to be successful. Local level reconstruction includes the participation of national and local actors, institutions and resources. Development assistance, provided by international organisations plays an important role in these difficult processes. Development assistance should be focused on two main tasks and directed by one guideline: first, there is the continuation of delivering support to indigenous efforts including the acknowledgement of their limitations. Second, is enabling local level initiatives by focusing particular on solutions for possible constraints or obstacles. Initial needs assessments and analyses of capabilities and political economy can provide the baseline for the recovery process. Furthermore, in order to prevent social tension or any possible action that can lead to a relapse of conflict, support strategies need to take political, ethnic and religious dynamics into account. Key element of the indigenous drivers approach is the focus on decreasing the risk of conflict. Ohiorhenuan and Stewart (2008) recognises the need for reducing conflict risk: "nurturing indigenous drivers involves explicitly identifying the capacities, capabilities and tensions inherent in systems and processes and in organisational, community and even national dynamics as observed in the immediate aftermath of conflict. Recovery policies should respect these dynamics even as they determine where they may need to be modified or strengthened" (p. 50). Although the indigenous driver approach is a key element for the successful reconstruction of a conflict affected area, the need for development assistance from the international community remains necessary. This means that local communities should be engaged in strategic planning. This requires interaction between the local and international level.

The political economy factors address the need of International (governmental) actors to implement democracy into conflict affected areas. While the restoring of democracy stands high on the agenda of actors working in conflict management, the implementation of the accompanying goals and targets such as the holding of elections must be carefully performed to support economic development (Coyle and Pellillo, 2011). According to Flores and Nooruddin (2009) "countries that undergo extensive democratisation in the immediate post-conflict period recover more slowly than countries that do not" (p. 5). The reason for this could be the fact that "typically early elections in a highly polarized society empower elites, senior military leaders, and organized criminal elements" (Caldwell, 2009, p. 18). Montgomery (2008) analysed the donor-led reconstruction efforts in Afghanistan and describes 5 factors that illustrate the democracy – economic trade-offs as:

1. "The rule of law can degenerate into the rule of lawyers – litigious, costly, and dilatory;
2. Economic efficiency can turn into profligacy – piratical and predatory;

3. Free speech can reward superficiality and extremism;
4. The demand for unfulfilled rights can invite invidious reverse discrimination;
5. Checked-and-balanced governmental institutions can yield policy stasis" (p. 36).

Bureaucracy factors address the lack of effective interaction amongst the many actors involved. Furthermore, these factors concern corruption, waste, nepotism, and inefficiency regarding the (interim) national actors and international actors (Coyle and Pellillo, 2011; Mustafa et al., 2016). These problems require synchronisation, coordination, and integration of activities to achieve unity of effort. Many actors involved receive their funding through governmental support. The budget allocation depends on the relationships between these actors, logistical and compensatory needs (Coyle & Pellillo, 2011). Due to the often limited financial resources available, actors will compete with each other in order to retrieve a certain part of it. These processes are influencing the economic reconstruction in several ways. First, actors are typically aiming for retrieving the largest share of the financial resources. They also strive for a position in which they will have associated influence over the reconstruction efforts. Instead of sharing the same goal and share efforts, actors start to compete. Competitive behaviour amongst actors leads to 'own agendas' in order to be distinguishable instead of creating the desired unity of effort. As a result, actors intend to spend all of their budget because in most bureaucracies, 'the failure' to spend a designated budget typically leads to reductions for the next year (Tierney, 2010; Coyle & Pellillo, 2011; Mustafa et al., 2016). However, unnecessary budget spending is highly contradictory to the goal of reconstruction since it should be aimed at maximising the benefits for the local population instead of the donor. Additionally, the effective allocation and reallocation of organisation resources is hindered by the lack of an adequate feedback loop (Mises, 1983; De Coning, 2016).

The fact that most actors are being judged based on short-term outputs, they typically are less focused on long-term economic and development reconstruction efforts and thus spend most of their budget on short-term efforts (Easterly et al., 2006). According to Diamond (2005) this was particularly the case in Iraq where "a number of U.S. government agencies had a variety of visions of how political authority would be re-established in Iraq. In the bitter, relentless infighting among U.S. governmental actors in advance of the war, none of these preferences clearly prevailed" (p. 28-29).

The decision-making processes and management of information between these actors is another key element which affect the multi-actor interaction. Conflicts are complex and have a high level of uncertainty and rate of change, therefore actors need to display adaptive behaviour in order to fit best the complex and uncertain environmental conditions. According to Montgomery and Rondinelli (2004) in a country such as Afghanistan, where the security situation remains fragile, "many of the decisions about how to promote the development of Afghanistan are likely to be made rapidly, reactively, and in response to uncertain and ever-changing political forces. Careful deliberation is likely to be in short supply in the face of rapidly changing political trends and complex social and cultural conditions in Afghanistan" (p. 12). The absence of effective feedback mechanisms and accountability resulted in bureaucratic waste and inefficiency in both the Iraqi

and Afghanistan cases (Glanz and Rohde, 2006). In Afghanistan the US spent almost $860 million on training the indigenous police over a 7 year time period. According to Rashid (2009) "results were almost totally useless. This is because DynCorp (i.e. a by State Department contracted private firm) was training the indigenous police force to fight an insurgency rather than support their localities. The actions of the local police thereafter were observed to be as 'rapacious' as they were before (p. 205). Now current President of the GIROA, Ashraf Ghani, recognises the waste of international funding by stating "International technical assistance is considered to be largely wasted … hundreds of millions of dollars have gone into technical assistance only to increase corruption and misgovernance (p. 334).

Business economy factors are dealing with simply the cost-benefit reasoning behind collaboration. Intensive collaboration can lead to greater efficiency of resource management. Of course, there is a moment where the costs of coordination are higher than the gains got from coherence. Also organisations typically look for advantageous for themselves when it comes to coherence. Coherence can also create friction within a multidimensional organisation, especially when it comes to funding. This can either be because organisations need collaboration or government funding due to their own limited budget. On the other hand large organisations, who have sufficient own funding, can operate independently in terms of goal setting and policy making (van der Lijn, 2011).

Institutional factors address the fact that organisations with the same goals, aims and mandate are more likely to collaborate with each other than those who have differences between them. Organisations who want to become more interdependent need to collaborate with each other on fields as training and operations. Once collaborating becomes more common within the organisation, the leadership and communication will adapt accordingly. This enhances the chances of operational success. Efficient collaboration on the institutional level requires a common structure, rules, culture, planning and decision-making process. The Iraqi case identified two key lessons when it comes to inter-organisational collaboration (Rathmell, 2005):

1. "The importance of institutionalising processes and table top exercises, including the planning of multiple scenario's, contingency planning and availability of resources for better or worse scenarios";
2. "The need for an institutionalised feedback loop whereby the field can recommend policy adjustments to higher decision-makers" (p. 1032-1033).

According to Rathmell (2005) friction was seen in "the locus of planning in a mission and the relationships of the mission headquarters both upwards, to its higher headquarters in national capitals, and downwards, to field offices (p. 1033). Indeed, the Coalition Provisional Authority (CPA) had to deal with poor C2. This was particularly the case in the relationship between Baghdad and the CPA regions (Rathmell, 2005). The fact that the CPA had to deal with a lack of reliable IT assets resulted in a lot of face to face communication. IT assets are defined as "widely available, off-the-shelf or commodity like information technologies that are used to process, store, and disseminate information" (Wade and Hulland, 2004, p. 109). Those consultations

were hindered or time-consuming due the fragile security situation throughout the country. This indicates the importance of the strategic deployment of IT-assets, preferably providing a collaborative information environment. The failure of effective integration also can be blamed to the distance between policy makers and those conducting field work. Mission design, goal setting and guidelines often are made by policymakers remote from the operational environment (Weinberger, 2002; Soeters, 2008). Further, there are difficulties with coordinating aid strategies among UN departments, international financial institutions, NGOs and bilateral donors (Patrick, 2001), as well among military, humanitarian and private organisations (van Marrewijk and Were, 2003; Reuther, 2011). Miscommunication between civilian and military actors can be found in Bosnia (since 1995) and Kosovo (1999) where NATO was in command of security and the UN in collaboration with NGOs were responsible for humanitarian affairs and development aid. Moreover, the coordination of efforts appeared to be even difficult in missions with a single C2 structure such was the case in East-Timor, where UNTAET had difficulty with leading and coordinating their broad range of activities (Weinberger, 2002; Soeters, 2008; Oltshoorn and Soeters, 2016).

Organisation cultural factors describe the differences in the values and beliefs, or organisational culture of the many actors involved. There are differences in planning, decision-making and management practices which has to seek for coherence. More importantly, military organisations usually have a short-term planning horizon which is often focused on targets or desired effects (van der Lijn, 2011; Shetler-Jones, 2016). Civilian organisations and Ministries of Foreign Affairs commonly focus more on long-term efforts. This highlights again the essence of the locus of planning described by Rathmell (2005).

Environmental factors describe that the context in which the stabilisation operation operates is a critical element in relationship to the interaction of the many actors involved (Leslie et al., 2008; Lindley-French, 2013). In areas where the security situation is unstable the more likely the need for coherence exist. In such situations the military component can be responsible for the security sector and provide a more secure environment for civilian organisations to conduct activities related to the development sector (Melkon et al., 2016; Shetler-Jones, 2016). The moment the military component will become more dominant this may change. Civilian organisations will be precocious with the deployment of their activities as long as kinetic activities remains high. Another factor is that NGOs are closely linked to civil society. The more engaged the local population is with the presence of the multidimensional organisation, the more likely they will seek for collaboration (Auteserre, 2014; Holmes-Eber, 2016). Finally the support from the home country or public support is essential for the mission as a whole (De Coning, 2016). Creating close collaboration, organisations can send integrated reports back to their home country. This is an essential aspect in providing the domestic tax-payers with information (Manning, 2008). This is an important property of the expected return. Especially in relation to the level of progress that have been made. Nowadays when most Western organisations also face financial recession in their home country the sense of urgency becomes even more important.

2.2.5 Conclusions

Over the last decades, stabilisation operations have been structurally complex (De Coning, 2016), yet their strategic model follows a general and structured input-process-output model that should be applicable to different operations (Ramalingam and Mitchell, 2014; ADDP, 2014; Chandler, 2016). However, one of the primary lessons learned from the interventions in the Former Yugoslavia, Iraq and Afghanistan was that such a general and linear structured input-process-output model (i.e. MEANS-WAYS-ENDS) is insufficient to represent the complexity of stabilisation operations since the interactions between the actors involved often show complex and dynamic patterns (Weinberger, 2002; Manning, 2003; Rathmell, 2005; Paris, 2009).

Actors working in the field of stabilisation operations must thus think and act in more holistic way that would consider the needs of a situation at the systemic level and how their individual efforts relate to those of others in order to achieve a unified effort (Williams, 2011; Rietjens et al., 2013; De Coning, 2016; Olsthoorn and Soeters, 2016). In other words, the behaviour of the whole cannot be explained by looking at the individual actors. As a result, the network supporting the integration, and mostly the strength, type and scope of the relationships between the actors is crucial to successfully bridging multi-actor efforts into an effective approach to the challenges that stabilisation operations face.

If linear thinking is not sufficient for the strategic modelling of stabilisation operations due to their complexity, an alternative is desirable. This alternative is proposed to be that of complex systems thinking and supports the debate over the extent to which integration is feasible and desirable.

2.3 SYSTEMS THINKING

In the early 20th century, several scholars from various backgrounds were involved in research regarding the control over systems, development of computer language and a relatively new field as a response to behaviourism, namely cognitivism (Barnard, 1938; McCulloch and Pitts, 1943; Wiener, 1948; Von Bertalanffy, 1950; Churchman, 1963; Berrien, 1968). Their research formed the basics of a new stream within organisational theory which came to be known as the systems approach, or systems thinking (Ackoff, 1962; Churchman, 1963). Systems thinking is characterised by it generality and is therefore applicable to a broad range of fields and problem areas (Mingers and White, 2009). We will now present the literature on systems thinking to better understand its history and logic which enables us to make the connection with stabilisation operations.

2.3.1 Isolated systems

The fundament of the systems approach, or systems thinking was called general systems theory (von Bertalanffy, 1950). It argued that the organisation was to be thought of as a system that is formed around various distinct sub-systems. Conversely, a system was to be part of a larger supra-system (Scott, 1961; Simon, 1969). This is known as systems hierarchy (see figure 2.1).

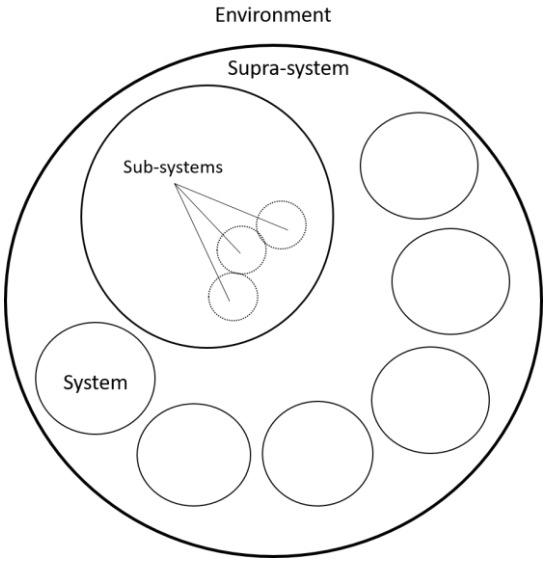


Figure 2.1: Systems hierarchy.

Barnard (1938) defines a system as follows: "a cooperative system is a complex of physical, biological, personal and social components which are in a specific systematic relationship by reason of the cooperation of two or more persons for at least one definite end. Such a system is evidently a subordinate unit of a larger systems from one point of view; and itself embraces subsidiary systems-physical, biological, etc.-from another point of view. One of the systems comprised within a cooperative system, the one which is implicit in the phrase "cooperation of two or more persons," is called an "organisation" (p. 3).

Researchers found that these sub-systems were interdependent and hence affected each other. Therefore, research on systems theory focused for the most part on understanding the interaction between the sub-systems as part of a system, or interacting systems as part of a supra-system (Boulding, 1956; Berrien, 1968; Buckley, 1968).

The connection between systems thinking and organisation was explicitly made by Scott (1961) when he connected organisational theory and systems thinking as follows: "the distinctive qualities of modern organisation theory are its conceptual-analytical base, its reliance on empirical research data, and above all, its integrating nature. These qualities are framed in a philosophy which accepts the premise that the only meaningful way to study it as a system… Modern organisation theory and general systems theory are similar in that they look at organisation as an integrated whole" (p. 21).

At the beginning of systems thinking many scholars studied systems as a linear phenomenon based upon the Newtonian paradigm. Linear systems are characterised by two mathematical principles, namely proportionality and superposition (Von Bertalanffy, 1968). Proportionality explains that a certain input (X) is generating a certain output (Y). When we multiply the input with a constant factor (A), the output will multiply accordingly (AY). Superposition relates to what is known as 'the whole is equal to the sum of its parts'.

Simply explained, input X1 and X2 are generating output Y1 and Y2. If we add an equal input to X1 and X2, an equal output of Y1 and Y2 is expected (Kast and Rosenzweig, 1972). These mathematical principles can be solved analytically or numerically and hence it is possible to calculate future output based on the initial conditions and a set of linear equations. In other words, they are deterministic. As a result, most of the research at the beginning of systems thinking was focused on the modelling, analyses and simulation of the behaviours of the system. According to this Newtonian paradigm, linear systems are characterised by impermeable boundaries in respect to their environment and thus are in a state of being isolated from its environment (Barnard, 1938; Boulding, 1956). According to the first law of thermodynamics, the internal energy of an isolated system is constant. Thus, an isolated system cannot exchange energy, information or matter with the environment (Tisza, 1977; Prigogine, 1997). Therefore, these systems are known as isolated systems (see figure 2.2).

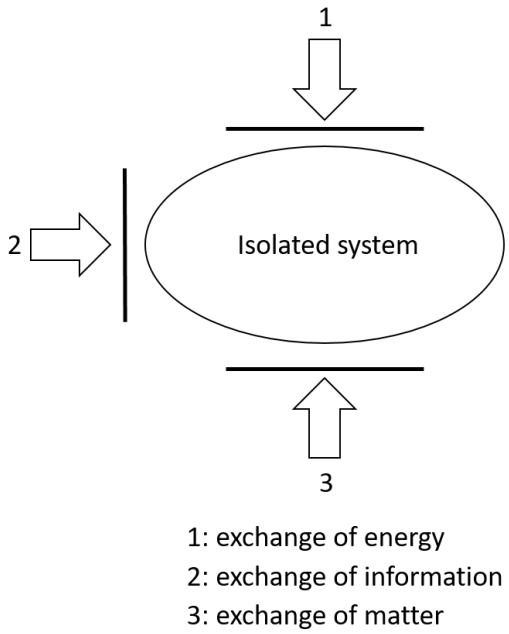


Figure 2.2: A system isolated from its environment.

2.3.2 Closed systems

A subsequent development in systems theory is that of cybernetic systems (Wiener, 1948; Ashby, 1952; Beer, 1979). Cybernetics are characterised by their ability to exchange energy and information with its environment (not matter) which allows for interaction with that environment (see figure 2.3). The process of energy exchange between a system and its environment is explained through the second law of thermodynamics: "heat cannot by itself pass from a colder to a hotter object" (Clausius, 1850). The second law explains that even in an isolated system differences in temperature or pressure can be observed. A commonly used example is that of the mixture of warm and cold water. This dynamic proceed in a certain direction, namely from order (i.e. warm or cold) to disorder (interaction). When considering a system of

being in a state of isolation, it will proceed towards ever increasing disorder. This process can be measured and expressed in 'entropy', which is the quantitative measurement of the level of evolution within a system.

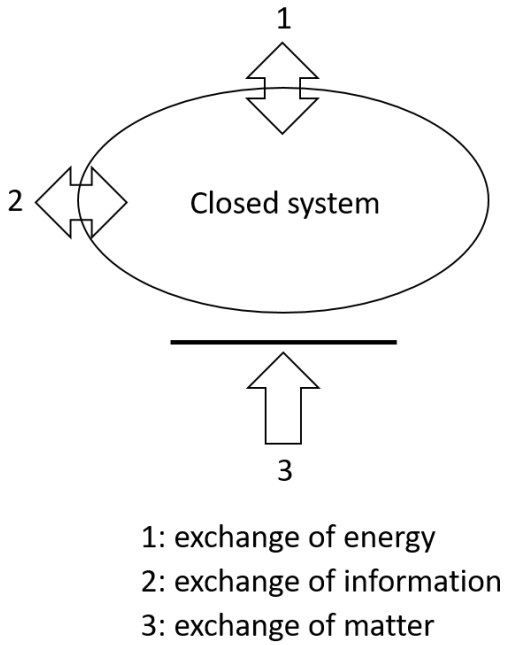


Figure 2.3: A closed system capable to exchange energy and information with its environment.

This view leads to the introduction of the element of feedback which allows for cybernetics, which means 'steersman', to demonstrate the self-regulating ability to response to disturbances from the environment with a stabilising adjustment while maintain their focus on goal-attainment (Wiener, 1948; Anderson, 1974; George, 1971). Since feedback is the main mechanism through which cybernetic systems self-regulate we need to distinguish between negative and positive feedback (Capra, 1996). At the beginning of cybernetics, research was primarily focused on negative feedback which occurs in a system when disturbances are amplified in order to maintain stable conditions. A commonly used example to illustrate the logic of a cybernetic system is that of a thermostat connected to the central heating of a building. Once someone sets the thermostat at a designated temperature it will automatically determine whether there's a gap between the designated temperature and the actual temperature sensed. This sensing will either trigger the heating system to switch on or off to keep a stable and ordered situation (i.e. the designated temperature). In systems theory, this is known as the concept of homeostasis (Heylighen and Joslyn, 2001). Figure 2.4 illustrates such feedback controls.

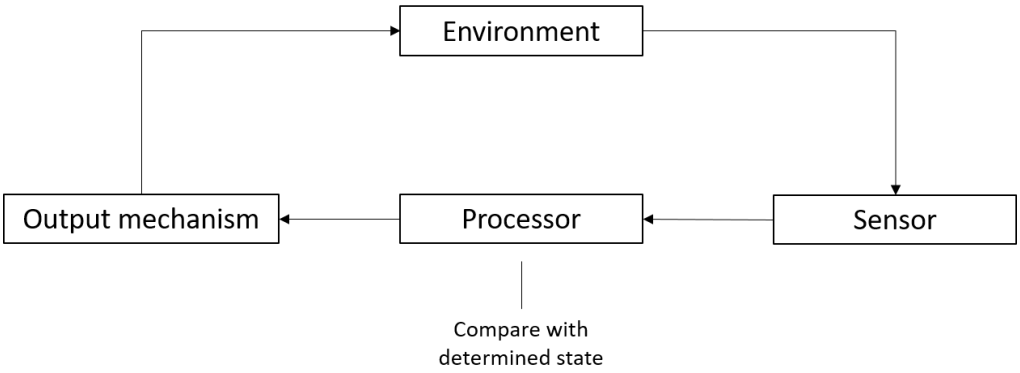


Figure 2.4: Simple negative feedback controls in a cybernetic system.

Beer (1967) describes closed systems, with their focus on controlling the disturbances from both inside and outside the system's boundary to settle the system in a state of homeostasis as follows: "a self-regulating servomechanism needs to operate as a closed system […] The whole point of homeostatic self-regulation in cybernetic machines is that the system should deal with disturbances; moreover with disturbances that have not been foreseen in principle by the designer. This requirement can be met only by a closed system in the servomechanism model" (p. 166).

2.3.3 Open systems

The Newtonian paradigm and its derivative way of thinking, including that of cybernetics, describes linear processes thereby making a system deterministic and hence predictable (i.e. the example of the thermostat). However, von Bertalanffy (1968) recognised that the second law of thermodynamics would not apply to living systems since they are unavoidable subject to an increase of entropy as the friction between the model and its environment changes. Hence, living systems are to be regarded as open system: "living systems are basically open systems. An open system is defined as a system in exchange of matter with its environment, presenting import and export, building up and breaking down of its material components…Closed systems are systems which are considered to be isolated from their environment" (p. 141). Accordingly, open systems can exchange energy, information and material with its environment (see figure 2.5).

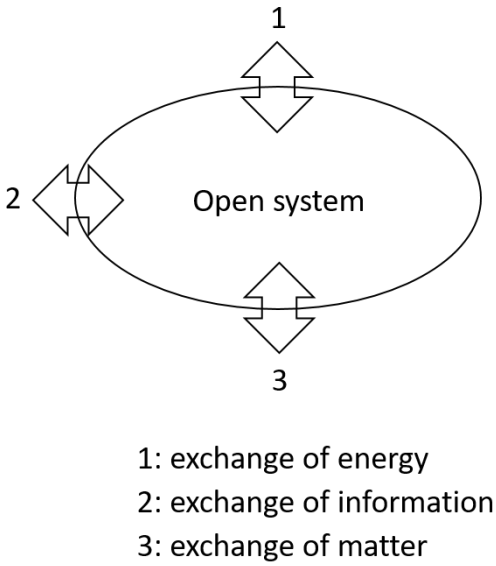


Figure 2.5: Open system capable to exchange energy, information and matter with its environment.

Open systems are characterised by non-linear feedback controls. Whereas negative feedback focuses on creating stable conditions by its stabilising adjustment in response to disturbances, positive feedback is responsible for change, growth and self-organisation by amplifying disturbances (Holland, 1995; Capra, 1996; Heylighen and Joslyn, 2001). These principles can be described as the dynamic behaviour of complex systems. The modelling of this dynamic behaviour (i.e. relationships between the various subsystems) is known as systems dynamics (Forrester, 1961).

Table 2.2 presents an overview of the main elements of systems thinking.

Table 2.2: Main elements of systems thinking.

Concept	Definition	References
Systems thinking	A system is formed around various distinct sub-systems. Conversely, a system is to be part of a larger supra-system.	Barnard (1938) McCulloch and Pitts (1943)
Holism	The behaviour of the whole system cannot be understood by examining the individual sub-systems.	Scott (1961)
Hierarchy	Since a system is composed of sub-systems of a lower order and is also part of a supra-system there is a hierarchy within the system.	Kast and Rosenzweig (1972)
Boundaries	Systems have boundaries that separate them from their environment. Hence, we can distinguish between isolated, closed and open systems.	Barnard (1938) Wiener (1948) Von Bertalanffy (1968)
Isolated system	Isolated systems cannot exchange energy, information or material with its environment.	Barnard (1938) Boulding (1956)
Closed system	Closed systems can exchange energy with its environment which allows for interaction with its environment	Wiener, (1948) Beer (1967)
Open system	Open systems can exchange energy, information and material with its environment.	Von Bertalanffy (1968) Prigogine (1997)
Negative feedback	Negative feedback focuses on creating stable conditions by its stabilising adjustment in response to disturbances.	Wiener (1948) Forrester, 1961)

		Capra (1996)
Positive feedback	Positive feedback is responsible for change, growth and self-organisation by amplifying disturbances	Forrester (1961) Holland (1995) Capra (1996)
Homeostasis	Self-regulation in a system that should deal with disturbances.	Beer (1967)

Stabilisation operations can be understood as a system that is formed around various distinct sub-systems which interact in a non-linear manner, in turn influencing a system's condition from inside the system's boundary (i.e. influenced by the internal organisation). Interactions in a non-linear fashion are defined as "complex" (Perrow, 1972; Waldrop, 1992; Capra, 1997). Thus, stabilisation operations can be viewed as complex systems. Moreover, stabilisation operations take place in a highly complex environment from which they cannot be isolated, thereby influencing a system's condition from outside the system's boundary (i.e. influenced by the external environment). Accordingly, we study stabilisation operations as complex open systems impacted by both its complex internal organisation and external environment.

2.3.4 Complex Adaptive Systems

As we have seen above, a complex open system is capable to exchange energy, information and matter with its environment. Through the processes of emergence and self-organisation, complex systems can adapt to disturbances or changes from their environment. Complex Adaptive Systems (CAS) are a very specific type of complex systems as they are able to transform the process of adaptation in a continuous one. To put it differently, a CAS adapts to disturbances from the environmental conditions and then respond to these adaptations themselves and so on (Gell-Mann, 1994; Holland, 1995). The dynamics of CAS are explained by a relatively new stream, namely complexity theory (Waldrop, 1992; Kaufmann, 1995) which is becoming more important in organisational thinking (Mingers and White, 2009).

Whereas at the introduction of the field many scholars applied complexity theory to the natural sciences (e.g. biology, computer simulation, mathematics, physics and chemistry), it emerged at a later stage in the various fields of the social sciences (Prigogine & Stengers 1984; Varela & Maturana 1992; Gell-Mann, 1994; Mitleton-Kelly, 2002). According to Mitleton-Kelly (2005), from a social science perspective, complexity theory is a useful explanatory framework for understanding human behaviour since it provides ground to explain: "how individuals and organisations interact, relate and evolve within a larger social ecosystem. Complexity also explains why interventions may have un-anticipated consequences. The intricate inter-relationships of elements within a complex system give rise to multiple chains of dependencies. Change happens in the context of this intricate intertwining at all scales. We become aware of change only when a different pattern becomes discernible" (p. 2). This definition illustrates our argument for studying stabilisation operations as complex system. However, to have a better understanding of complexity theory we will now describe its core characteristics in more detail.

To define complexity, Gell-Mann (1994) reflects on its *etymology*. *Complexus* stands for braided together and is derived from *plexus* meaning entwined or braided. This reference can be found back in Moffat's' definition of complexity: "intricate intertwining or interconnectivity of elements within a system, and between a system and its environment" (p. 68). In other words, the non-linear interactions that characterise a complex system can also be defined as a network. According to Bousquet (2009) "the network form implies a decentralised, open, and adaptable form of organisation, naturally best suited to adjusting to a rapidly changing environment through self-organising and emergent properties of the network (p. 205). However, the network organisational structure is not necessarily decentralised. Generally speaking, a network can be centralised, decentralised or distributed (Baran, 1964). Figure 2.6 presents an illustration of the three network organisational structures.

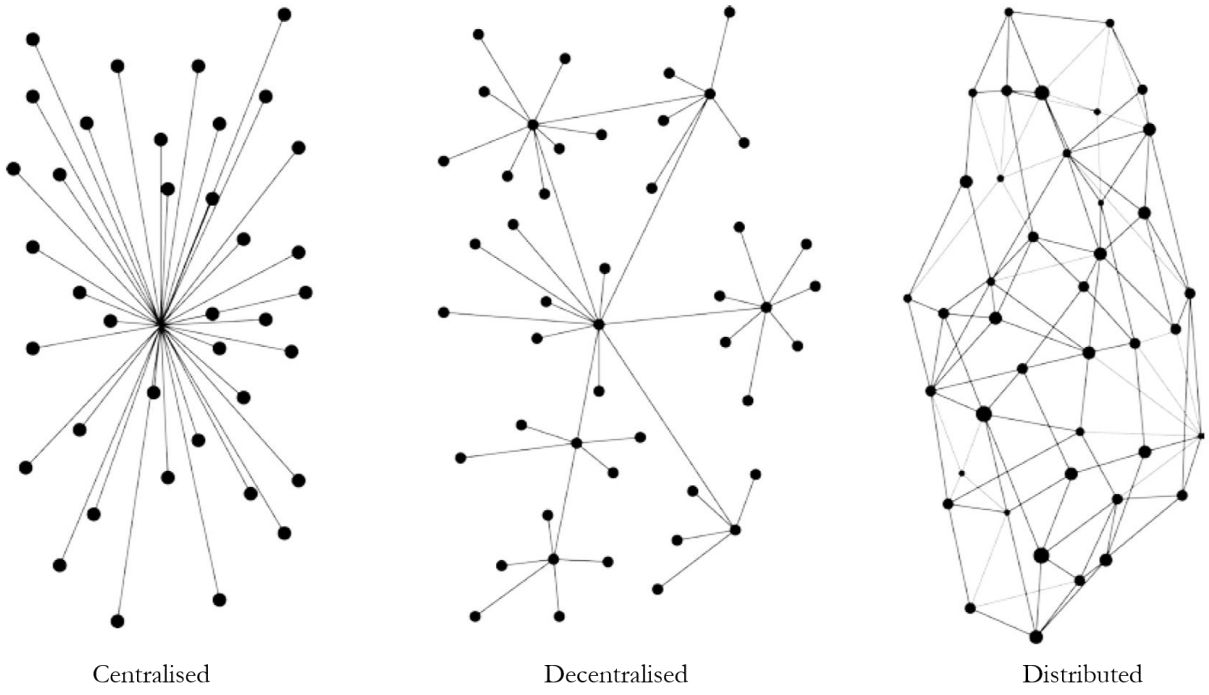


Figure 2.6: A network can be centralised, decentralised or distributed. Source: adapted from Baran (1964).

The definition provided by Bousquet highlights two central concepts of complex systems, namely self-organisation and emergence. First, self-organisation is defined by Capra (1997) as "the spontaneous emergence of new structures and new forms of behaviour in open systems far from equilibrium, characterised by internal feedback loops and described mathematically by non-linear equations" (p. 85). Hence, the actors within a complex system interact with each other by exploring new paths and processes without external control mechanisms. Since these stimuli are characterised by their non-linearity, output derived from self-organisation is highly unpredictable and subject to change (Checkland, 1981). The concept of self-organisation is derived from biological living systems where it is known as *autopoiesis* which explains the way each of the individual sub-systems is affecting the transformation of others and consequently the

whole system. In other words, a complex open living system is able to reproduce itself (Maturana and Varela, 1980; Walby, 2003).

Second, Goldstein (1999) defines emergence as "the arising of novel and coherent structures, patterns and properties during the process of self-organization in complex systems" (p. 49). More specifically, emergence is the outcome of the autonomous interactions of individual entities in a relationship which leads to self-organisation: "emergent properties, qualities, patterns, or structures, arise from the interaction of individual elements; they are greater than the sum of the parts and may be difficult to predict by studying the individual elements. Emergence is the process that creates new order together with self-organisation" (Mitleton-Kelly 2005, p. 19). Emergence is an inherently non-linear process since interactions can take place between two particular sub-systems and perhaps not between others. Hence, whereas the Newtonian paradigm was based upon linear thinking (i.e. principles of proportionality and superposition), the interactions in complex systems are non-proportional and hence non-linear (Waldrop, 1992; Gell-Mann, 1994). Capra (1992) connects the network and notions of non-linearity in these terms: "the first and most obvious property of any network is its non-linearity – it goes in all directions. Thus, the relationships in a network pattern are non-linear relationships. Particularly an influence, or message, may travel along a cyclical path, which may become a feedback loop. The concept of feedback is intimately connected with the network pattern (p. 82). Thus, complex systems can operate in stable equilibrium through negative feedback controls (i.e. the thermostat) or far from equilibrium through positive feedback. Because of this non-linearity, complex systems are highly sensitive to their initial conditions (Holland, 1995; Stewart, 2000). This phenomenon can be best explained through the non-proportionality of the cause and effect relationships (i.e. asymmetrical input to output) that characterise open systems. In other words, even the smallest changes to a system's initial condition may result in large-scale alterations in its future way of behaving. A system's sensitive dependence on the initial conditions is popularly known as the "butterfly effect" which is a metaphor for the question whether "the flap of a butterfly's wings in Brazil doe set off a tornado in Texas" to illustrate the complexity and unpredictability of weather systems (Lorenz, 1972, p. 181). In addition, open systems allow for certain results that potentially could be achieved from alternative initial conditions as well as alternative ways as these differences can be amplified through positive feedback controls. This is known as the *equifinality* of open systems (Prigogine, 1985; Gleick, 1987).

Table 2.3: Key concepts of CAS.

Concept	Definition	References
Emergence	The arising of novel and coherent structures, patterns and properties during the process of self-organization in complex systems.	Goldstein (1999)
Self-organisation	The spontaneous emergence of new structures and new forms of behaviour in open systems far from equilibrium, characterised by internal feedback loops and described mathematically by non-linear equations.	Capra (1997)
Non-linearity	When the change of the output is not proportional to the change of the input.	Waldrop (1992) Gell-Mann (1994)

Sensitive dependence on the initial conditions	Small changes to a system's initial condition may result in large-scale alterations in its future way of behaving.	Holland (1995) Lorenz (1971)
Equifinality	Results that potentially could be achieved from alternative initial conditions as well as alternative ways as these differences can be amplified through positive feedback controls.	Prigogine (1985) Gleick (1987)

As we have seen above, a complex open system is capable to exchange energy, information and matter with its environment. Through the processes of emergence and self-organisation complex systems can adapt to disturbances or changes from their environment. Complex Adaptive Systems (CAS) are a very specific type of complex systems as they are able to transform the process of adaptation in a continuous one. To put it differently, a CAS adapts to disturbances from the environmental conditions and then respond to these adaptations themselves and so on (Gell-Mann, 1994; Holland, 1995). In the language of CAS this is called co-evolution (Heylighen, 1996). According to Gell-Mann (1994) the co-evolution of CAS takes place through the mechanisms of information processing, distribution and exchange: "a complex adaptive system acquires information about its environment and its own interaction with that environment, identifying regularities in that information, condensing those regularities into a kind of "schema" or model, and acting in the real world on the basis of that schema, and the results of that action in the real world feed-back to influence competition among these schemata" (p. 17). Hence, schemata consist of identified patters and correlations which allows for a CAS to either predict events that take place outside the system boundary (i.e. its environment) or create prescriptions for its own behaviour within the system's boundary and in relationship to its environment. This needs to be regarded as a continuous cycle in which these schemata are continuously being analysed, adjusted and reconstructed as the CAS receives new information through interaction with its environment and subsequently co-evolves (Gell-Mann, 1994; Holland, 1995; Moffat, 2003). Figure 2.7 illustrates the way a CAS co-evolves through the process of schemata.

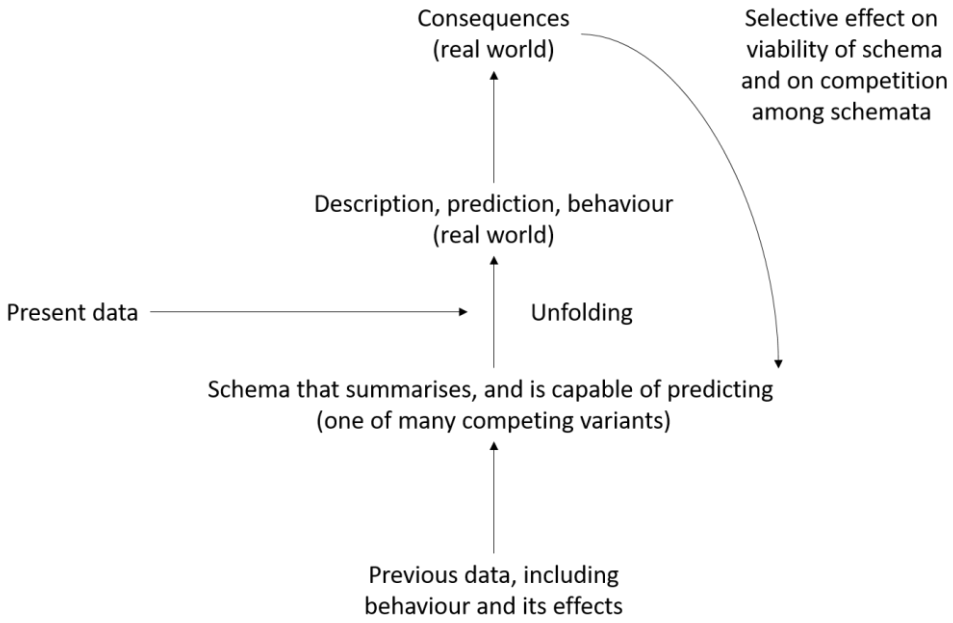


Figure 2.7: The way a CAS evolves using schemata. Source: adapted from Gell-Mann (1994).

The process of co-evolution is closely related to the phenomenon of bifurcation which explains for the splitting of a main body into two parts. According to Urry (2003) "systems reach points of bifurcation when their behaviour and future pathways become unpredictable and new higher order, more differentiated, structures may emerge" (p. 28). More specifically explained: from the perspective of control values, a system will respond to all disturbances with a stabilising adjustment in order to establish ordered conditions. Once control values reach a level where the first bifurcation takes place, two alternative ordered conditions will be developed. Depending on the disturbance encountered, the system will settle in one of these alternative states. This is a continuous process in which the possible states are constantly multiplied until it reaches a point where a system will establish chaotic conditions. According to the theory, it is at this turning point, where the bifurcation process is at its greatest state and a system is still settled in the ordered conditions, that flexibility and adaptability is maximised (see figure 2.8).

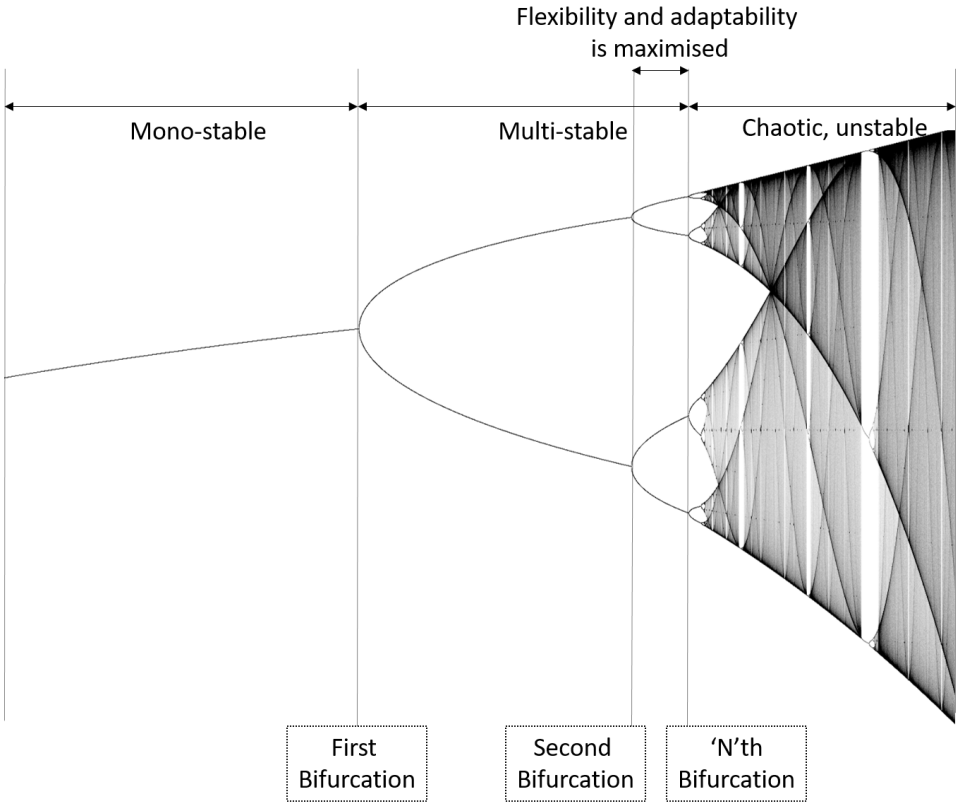


Figure 2.8: Bifurcation diagram of a complex system. Source: adapted from Beckerman (1999).

Waldrop (1992) defines the state in which co-evolution is the most effective as "complexity", and can be found balancing between order and chaos: "right between the two extremes [order and chaos], at a kind of abstract phase transition called "the edge of chaos", you also find *complexity*: a class of behaviours in which the components of the system never quite lock into place, yet never quite dissolve into turbulence, either. These are the systems that are both stable enough to store information, and yet evanescent enough to transmit it. These are the systems that can be organised to perform complex computations, to react to the world, to be spontaneous, adaptive, and alive" (p. 293). Gell-Mann (1994) connects complexity and the development of schemata as follows: systems that are settled in highly ordered conditions show stable behaviour and hence would be characterised by low information content (i.e. the schemata can only be expressed in very few ordered conditions). By contrast, after multiple bifurcations chaotic conditions are established and hence information content would be absent. Consequently, information content is greatest in between order and chaos.

In sum, by looking at the attributes of complex systems many analytical challenges and implications to model or simulate such a model appear. In contrast to the Newtonian paradigm, which traditionally focused on gaining a full and comprehensive understanding of a system, complexity theory allows for a more qualitative understanding of the cognitive processes and recognising information processing as the key operating

process through which these systems (i.e. organisations) adapt and self-organise their organisational resources and ultimately co-evolve using schemata.

Additionally, now we have introduced systems theory and more specifically complexity theory, we have learned that a specialised functional area of an organisation is recognised as a sub-system. Strategic management theories view an organisation (i.e. system) as a collection of organisational resources and competencies, each with different capabilities (Wernerfelt 1984; Barney, 1991; Dyer and Singh, 1998). Thus, strategic management theories view the sub-systems as sets of organisational resources. According to Nevo and Wade (2010) "the recognition that some organisational resources are systems - that is, organisational subsystems - implies that the key concepts of systems theory and the resource based view (RBV) are isomorphic, and that a synthesis of the theories is meaningful" (p. 174). Thus, whereas organisational resources and competencies are the final stage of systems theory, they are the starting point of strategic management theories.

2.4 RESOURCE BASED VIEW

An influential strand in the strategic management is the resource based view (RBV), which offers an analytical framework regarding the use of organisational resources. According to the RBV, each organisation consists of organisational resources and competencies, each with different capabilities (Wernerfelt, 1984; Barney, 1991). Hence, the RBV emphasises the heterogeneity of organisations. The RBV finds its basis in economic theories focusing on monopolism and imperfect competition (Chamberlin, 1933; Robinson, 1933). These theories propose that diversity amongst various organisations and hence imperfect competition are the enabling conditions to enhance their strategic potential. Penrose (1959) argues that the 'whole organisation' needs to be considered as a collection of organisational resources. Different combinations of organisational resources derived from these collections is what results in firm heterogeneity and hence a monopolistic position. The speed of the accumulation and assimilation of organisational resources is what results in organisational growth. Penrose (1959) further suggest that organisations do not benefit from the organisational resources themselves but from the services derived from them.

Various scholars have provided definitions for organisational resources, competencies and capabilities. According to Amit and Schoemaker (1993) organisational resources are "stocks of available factors that are owned or controlled by the firm" (p. 35). This definition implies that an organisation has a sense of ownership and control over their organisational resources. Competencies relate to "a firm's capacity to deploy resources, usually in combination, using organisational processes, to effect a desired end" (p. 35) and thus according to Hamel and Prahalad (1994) represent "…a bundle of skills and technologies rather than a single, discrete skill or technology" (p. 202). Capabilities, in turn, refers to the use and deployment of these competencies to attain the organisational objectives (McGrath et al., 1995; Teece et al., 1997).

We now have come to the point where we have described that a system is formed around various distinct sub-systems and is part of a greater sub-system. Moreover, by introducing the literature on strategic management we have learned that a system is the equivalent of an organisation which commonly consist of various specialised functional departments. More importantly, we have learned through the lens of strategic management theory that a sub-system (i.e. a specialised functional department) and its overall system (i.e. an organisation) can be viewed as an organisational resource or a collection of organisational resources respectively. Connecting these findings to the literature on complex systems we understand information processing as the key operating process through which these systems (i.e. organisations) adapt and self-organise their organisational resources and ultimately co-evolve using schemata. However, the conceptualisation of information processing as the key operating process remains quite abstract this far. To have a better understanding of this we will now delve deeper into the literature on information processing, distribution and exchange.

2.5 INFORMATION PROCESSING THEORY

Information processing includes the collection, interpreting and synthesising of information (Tusman and Nadler, 1978). By information processing, organisations can utilise information in daily operations while simultaneously reducing their information requirements for future planning. These requirements are based upon the complexities of an organisation's task and environment in which it operates (Daft and Lengel, 1986). Hence, in order to achieve organisational performance, environmental conditions and organisational design features should be transformed into information processing capabilities (Rietjens et al., 2007). These processes are inherently important for organisations that encounter strategic and environmental conditions that are uncertain or ambiguous. According to Galbraith (1973) "the greater the uncertainty of the task, the greater the amount of information that has to be processed between decision-makers during the execution of the task. If the task is well understood prior to performing it, much of the activity can be pre-planned. If it is not understood, then during the actual task execution more knowledge is acquired which leads to changes in resource allocations, schedules and priorities. All these changes require information processing during task performance" (p. 28). Consequently, the degree of uncertainty determines an organisation's ability for preventatively planning and decision-making. Following information processing theory, the degree of uncertainty and the volume of information which needs to be distributed are regarded as a cause and effect relationship. Thus, organisations that face considerable uncertainty require considerable amounts of information to be processed. Connecting Galbraith's argument to stabilisation operations, we can expect that the extent to which the environmental conditions impact the predictability of stabilisation operations as complex systems are thus depending on information processing. Since stabilisation operations are characterised by an environment which is highly uncertain and ambiguous, large amounts of information needs to be processed between the various sub-systems as well as between multiple complex systems as part of the supra-system.

Organisations that are characterised by their strong hierarchical structure find difficulty in processing such large amounts of information (Rietjens, et al., 2007). Consequently, new design strategies are to be adopted to effectively coordinate daily operations. Galbraith (1973) introduced two organisation design strategies to better deal with uncertainty. First, an organisation can act with the intent of reducing the amount of information being processed. Conversely, they may act with the intent to increase its capacity to process information. Figure 2.9 illustrates the two organisation design strategies and their processes.

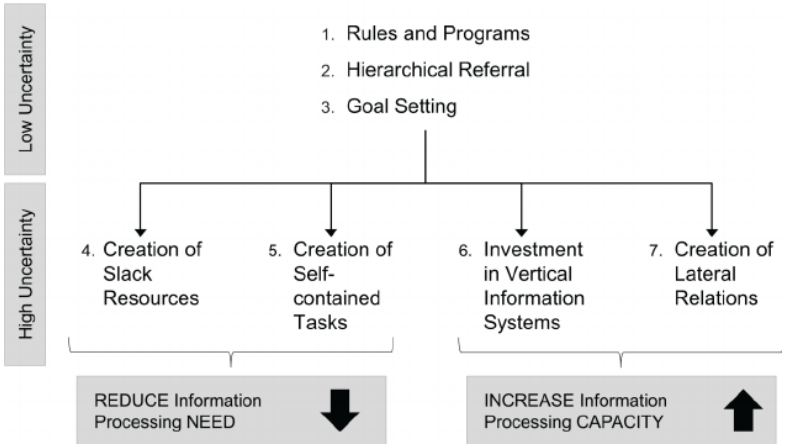


Figure 2.9: Organisation design strategies. Source: adapted from Galbraith (1973).

The amount of information being processed can be reduced through the creation of slack resources which in turn decrease the level of interdependence between sub-systems (March and Simon, 1985; Cyert and March, 1963). Slack resources ensure that the required amount of information remains inside the overall process storage of the whole organisation. Another method to lower the volume of information which needs to be distributed is by changing sub-system grouping from input-to output-based by providing the individual sub-systems with the organisational resources that are needed to provide the output. In other words, information processing is ensured through a clear division of labour and the creation of small autonomous groups.

By contrast, information processing can be increased by investing in vertical information systems which subsequently allows for an increase in information processing capacity without creating an information overload the centralised (i.e. hierarchical) communication channels. The second method for increasing information processing is by establishing lateral relationships that cross-cut the centralised lines of bureaucracy. An important difference with the creation of self-contained tasks is that this method does not reorganises an organisation into self-contained groups (i.e. differentiation).

2.6 CHAPTER SYNOPSIS

In this chapter, we consecutively introduced the literature on stabilisation operations and systems thinking to illustrate the desirability to view stabilisation operations as complex systems. We subsequently presented

the literature on strategic management theory to illustrate the implications of systems thinking regarding the use of organisational resources, competencies and capabilities. Finally, the literature on information processing theory was presented to explain the function of information processing, distribution and exchange in organisations that are dealing with complex environmental conditions.

In short, the answers presented in this chapter illustrate the knowledge gap for the strategic modelling of stabilisation operations and raise the need for an alternative with complex systems thinking to bridge the gap. The findings of this literature study form the foundation of the development of the initial conceptual model and is presented in the next chapter.

3

Initial conceptual model

"We realise, however, that all scientific laws merely represent abstractions and idealisations expressing certain aspects of reality. Every science means a schematised picture of reality, in the sense that a certain conceptual construct is unequivocally related to certain features of order in reality".

- *Ludwig von Bertalanffy (1968)*

3.1 INTRODUCTION

The literature review offered a more detailed insight of the theoretical constructs which form the fundament of the initial conceptual model. This model is used to structure the empirical part of this study. This chapter is organised as follows: after this introduction, we present the initial conceptual model. We then discuss the relevant theories which provide some background to the constructs, provide their definitions and conclude with the presentation of the preliminary propositions.

3.2 THE FUNCTION OF THE INITIAL CONCEPTUAL MODEL

As defined by Bacharach (1989), a theory "may be viewed as a system of constructs and variables" (p. 498). Theoretical constructs are more abstract and unobservable units, while variables, derived from the constructs, are observable units which can be operationalised through empirical research and measurement. In figure 3.1 we illustrate that constructs relate to each other by propositions and variables by hypotheses.

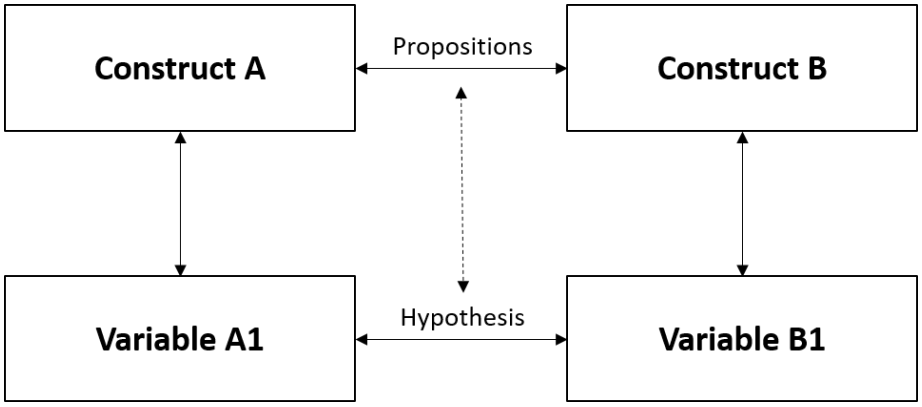


Figure 3.1: Propositions and hypothesis. Source: adapted from Bacharach (1989).

3.3 PRESENTING THE INITIAL CONCEPTUAL MODEL

By presenting the initial conceptual model we illustrate the shift from linear thought processes towards complex systems thinking as an alternative for the strategic modelling of stabilisation operations. This alternative is to cope more effectively with the complexity of multi-actor interaction and supporting the debate over how much integration is feasible and desirable. Accordingly, the initial conceptual model is based upon complex systems modelling tools. More specifically, the initial conceptual model is based upon system dynamics theory which focuses on a system's behaviour patterns and the underlying causal mechanisms, in contrast to discrete simulation which focuses on individual events. System dynamics finds its origin in the idea that non-linear behaviour of a complex system is a consequence of non-linear feedback controls (i.e. positive and negative feedback) (Forrester, 1961). These non-linear feedback controls can be the result of intentional choice (i.e. design) or determined by environmental demands. Moreover, system behaviour is found to be the result of the non-linear interaction between different feedback loops (Sterman, 2000). By developing the final conceptual model following the principles of system dynamics we provide insight into the overall behaviour patterns of stabilisation operation as well as the possible manners by which their non-linear behaviour could be influenced.

The conceptual model illustrates the impact of the complexity of the internal organisation and external environment on stabilisation operations as complex systems. The nature of these environmental conditions is constantly changing as well as its impact on the multi-actor interaction, thereby making it almost impossible for a single actor to comprehend the entire field of environmental conditions and ultimately their impact on the overalls system's condition. Consequently, we view these systems as complex open systems with environmental conditions that are essentially non-linear and presenting one problem after another. In such complex open systems, each actor can display, independently, three alternative states of behaviour (i.e. stable, instable, or bounded instable) in response to these non-linear dynamics (Stacey, 1995). These states of behaviour, in turn, impact a system's condition.

The non-linear feedback controls are argued to influence a system's ability to respond to disturbances with a stabilising adjustment in order to guide or return a system to its desired state (i.e. negative feedback), or to amplify disturbances and thus move it further away from its point of origin (i.e. positive feedback). The decision to utilise one mechanism or the other is either the outcome of intentional choice (i.e. by design) or determined by environmental demands (Lawrence and Lorsch, 1967). In other words, non-linear feedback controls are the result of responses to uncertainty derived from the environmental conditions.

A system's response to uncertainty derived from the environmental conditions is inherently depending on the mechanism of information processing, distribution and exchange (Galbraith, 1974), thereby making information feedback the key organising concept through which these systems differentiate and integrate. A system's self-organising ability to differentiate and integrate its sub-systems, organisational resources and competencies influences the development of condition-dependent capabilities: whereas sub-system capabilities are those derived from a state of differentiation within a single system (i.e. a single sub-system effort), system capabilities are those derived from a state of integration within a single system (i.e. a single system effort), while supra-system capabilities are derived from a state of integration within the supra-system (i.e. efforts from two or more systems in a relationship).

A system's self-organising ability to develop condition-dependent capabilities positively influences the attainment of outcomes since we expect that self-organisation (i.e. the decision to utilise one mechanism or the other) fits best to the uncertainty derived from the environmental conditions. The initial conceptual model is presented in figure 3.2.

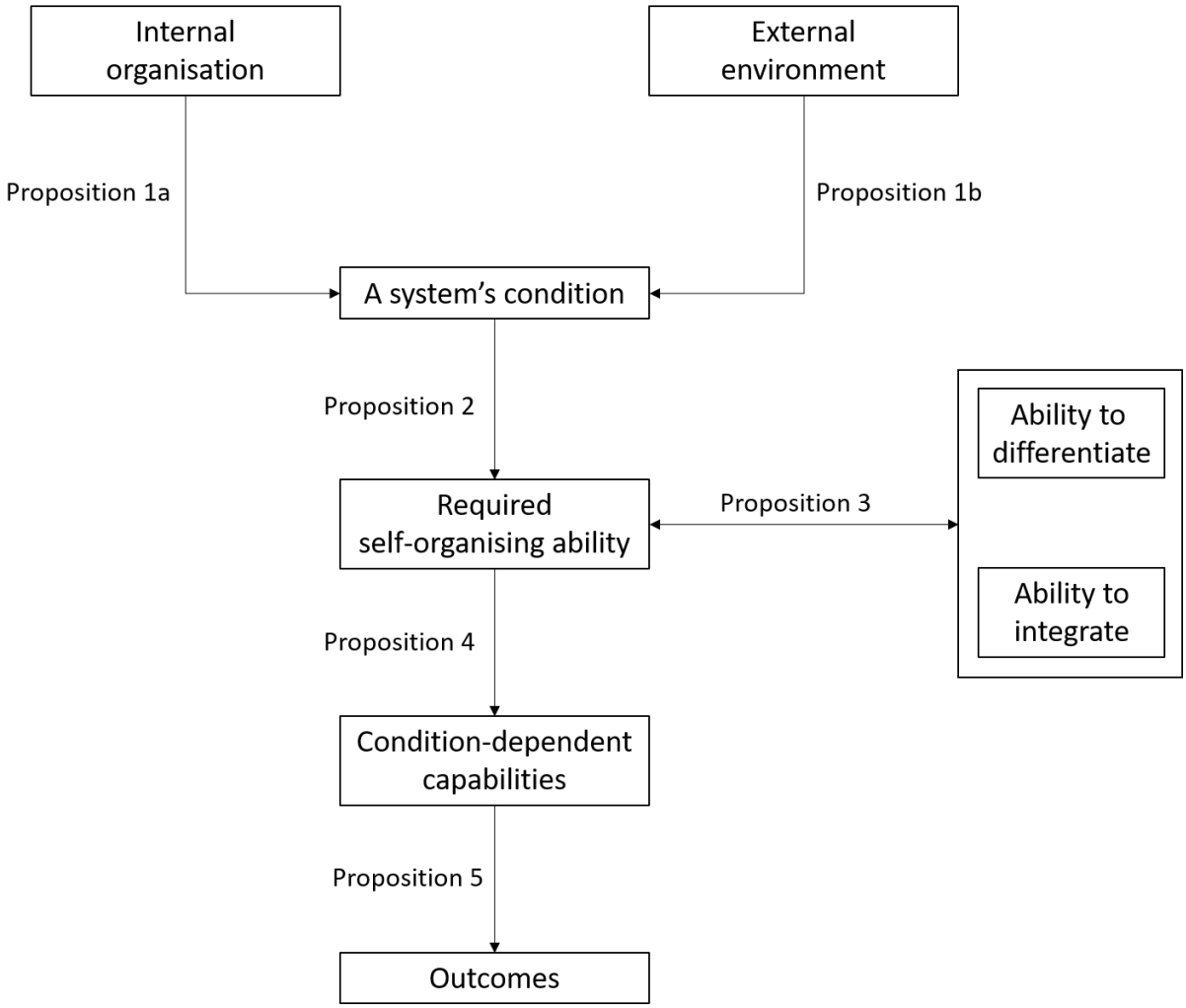


Figure 3.2: The initial conceptual model.

3.4 THE CONSTRUCTS AND THEIR DEFINITIONS

In this part, we describe the theoretical foundations of the initial conceptual model. The theoretical foundation has a multi-disciplinary character and includes systems theory, complexity theory, strategic management theory and information processing theory. The literature on complexity and systems theory explains how the environmental conditions impact a system's condition. The combination of literature on complex systems, strategic management literature and information processing theory is to support the conceptualisation of a systems self-organising ability to use differentiation and integration to develop condition-dependent capabilities. These capabilities, in turn, potentially can positively support the attainment of outcomes. We will now briefly discuss and provide definitions of the constructs of the conceptual model.

3.4.1 Uncertainty and the impact on a system's condition

In this study, we focus on the complexity and uncertainty derived from the environmental conditions and their impact on a system's condition. The internal organisation explains a system's internal processes, thus, impacting its condition from inside the system boundary. By contrast, the external environment consists of external factors that impact a system from outside the system boundary (North, 1990; Meyer, 1994; Lee et al., 2006; Hutzschenreuter and Israel, 2009; Carney and Gedajlovic, 2011). Hence, we study the impact of the uncertainty derived from the environmental conditions on a system's condition as a cause and effect relationship.

3.4.2 Self-organisation through differentiation and integration

A system's required ability to react to the impact and rate of change of the uncertainty derived from the environmental conditions is depending on mechanisms of information processing, distribution and exchange (Galbraith, 1974). As a result, we propose information feedback as the key organising concept through which these systems differentiate and integrate their subsystems, organisational resources and competencies (i.e. changing conditions trigger organisational adaptations). However, differentiation and integration might not be observed without the support of enabling conditions. First, a system must consist of sub-systems that are compatible, that is the feasibility of the relationship. Second, in order to integrate, actors must display an integration effort. That is, the desirability of the relationship. We argue that compatibility and integration efforts are determined by non-linear feedback mechanisms that will result in unpredictable emergent behaviour.

3.4.3 Condition-dependent capabilities

In this study, we introduce the development of sub-system, system and supra-system capabilities through self-organisation as condition-dependent capabilities (i.e. new organisational forms emerge and adapt). Sub-system capabilities are the high-level practices which belong to the organisational resources and competencies of a single sub-system. In other words, a single system is differentiated into several distinct sub-systems. System capabilities are the high-level routines (or a collection of routines) that are formed through the relationships between the organisational resources and competencies of multiple sub-systems. Hence, a single system is integrated. Supra-system capabilities are the high-level routines (or a collection of routines) that are formed through the relationships between organisational resources and competencies from two or more systems, that is, they are integrated.

3.4.4 Outcomes

We differentiate between two types of outcomes that could be obtained by condition-dependent capabilities, namely strategic or operational (Subramani, 2004; Graighead et al., 2006). However, stabilisation operations often deal with 'wicked problems' (Rietjens and De Waard, 2017). Rittel and Weber (1973) define 'wicked problems' as "problems that are ill-defined, several, conflicting criteria for solution definition, solutions which create further problems and no obvious indications of when enough has been achieved (p. 155).

Thus, although we argue that condition-dependent capabilities positively impact the generated outcomes, they will be ill-defined and difficult to measure. The definition of each construct is presented in table 3.1.

Table 3.1: Constructs and their definitions.

Construct	Definition	References
Internal organisation	Factors inside a system's boundary that impact its condition.	Duncan, 1972; Draft et al., 1988; Worley and Lawler, 2010
External environment	Factors outside a system's boundary that impact its condition.	Duncan, 1972; Draft et al., 1988; Worley and Lawler, 2010
A system's condition	The class of behaviours in which actors interact as a response to the impact of the environmental conditions.	Snowden (2002)
Required self-organising ability	A system's ability to apply the factors of differentiation and integration as a response to the environmental conditions.	Goldstein (1999)
Ability to differentiate	The state in which the organisational system is differentiated into sub-systems, each of which displaying particular behaviour in relationship to the environmental conditions.	Lawrence and Lorsch (1967)
Ability to integrate	The state in which the organisational system is integrated and displaying particular behaviour in relationship to its environmental conditions.	Lawrence and Lorsch (1967)
Condition-dependent capabilities	High-level routines that are formed through the self-organising ability of a system to differentiate or integrate.	Amit and Schoemaker (1993) Hamel and Prahalad, 1994) Teece et al., (1997) Orlikowski (2000) Nevo and Wade (2011)
Outcomes	The outcomes generated from the deployment of condition-dependent capabilities.	Subramani, 2004; Graighead et al., 2006

3.5 PRELIMINARY PROPOSITIONS

This section presents the propositions which are based on the relationships between the constructs (table 3.1) as illustrated in the initial conceptual model (figure 3.2)

3.5.1 Uncertainty and the impact on a system's condition

Most of the literature on organisation design argues that complexity, unpredictability, and instability of the external environment seems to have outpaced traditional organisation design approaches and concepts (Duncan, 1972; Draft et al., 1988; Worley and Lawler, 2010). Indeed, stabilisation operations take place in a highly complex, dynamic and uncertain environment from which it cannot be isolated, thereby influencing a system's condition from outside the system's boundary (i.e. the external environment). However, as we have learned throughout this study, stabilisation operations require a highly differentiated as well as

integrated organisational system with interaction between the actors of its sub-systems. These interactions relate to a broad range of issues, take place under complex and uncertain conditions, with each interaction following its own pace dictated by its specific conditions. Hence, stabilisation operations can be thought of as complex systems formed around various distinct sub-systems that are interacting in a non-linear way, in turn influencing a system's condition from inside the system's boundary (i.e. the internal organisation). Thus, stabilisation operations are heavily impacted by the uncertainty derived from the environmental conditions. In this study, we define internal and external uncertainty as the lack of complete information in regards to what exists and what developments may occur in the environmental conditions, and their subsequent impact on a system's condition. In other words, the impact of uncertainty on the predictability of a system's condition can be seen as a cause and effect relationship.

Internal and external uncertainty can be divided in two categories, namely complexity and change. Internal and external complexity relate to the number of issues to which stabilisation operations must attend and the degree to which they are interconnected. Internal and external change relate to the degree of discontinuous unintentional change that occurs within a stabilisation operation and in its environment. Furthermore, internal and external uncertainty can be categorised in four distinct domains (Duncan, 1972). Figure 3.3 illustrates the four dimensions and corresponding levels of internal and external uncertainty.

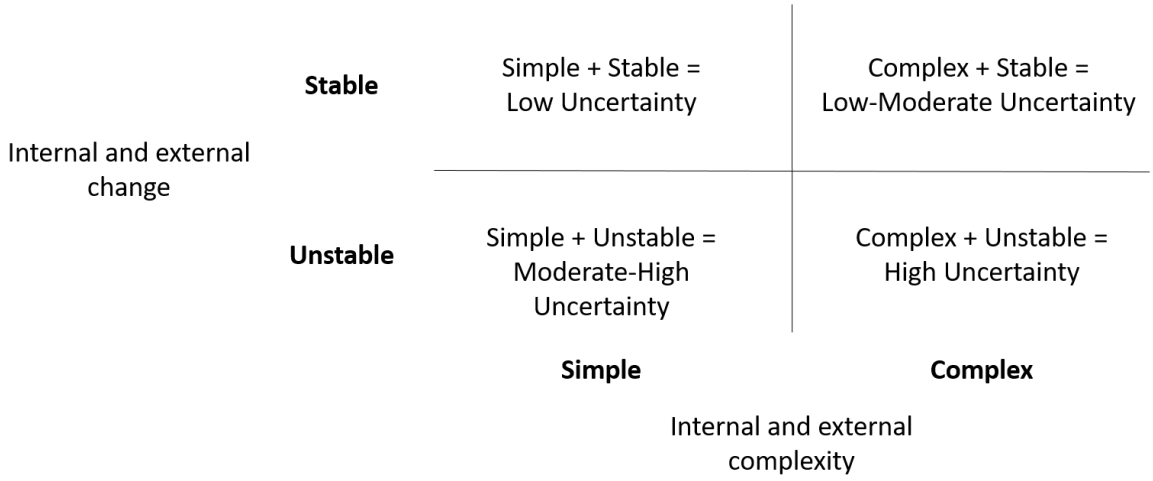


Figure 3.3: Internal and external uncertainty (Duncan, 1972).

To provide a more detailed conceptualisation of a system's condition we apply the Cynefin framework (Snowden, 2002). The framework (see figure 3.4) consists of three main domains (i.e. ordered, unordered and disordered) that reflect the different relationships between causes and effects and derivative ways of practices. For every domain, the framework presents a different form of behaviour which then implies for different forms of connections.

The ordered domain distinguishes two types of situations. First, it describes a situation in which the cause and effect relationship is "simple" for systems. In other words, cause and effect relationships are self-evident

and systems should be able to use them to forecast. According to the Cynefin framework, the expected approach to this situation is that of Sense – Categorise – Respond (SCR) followed by the application of best practices with their strong central connections and weak distributed ones. Second, it describes a situation in which cause and effect are "complicated". Thus, with sufficient time, information and resources, actors should be able to comprehend cause and effect and apply it to forecasting. An expected approach in this situation is to Sense – Analyse – Respond (SAR), followed by the application of good practices characterised by both strong central and distributed connections.

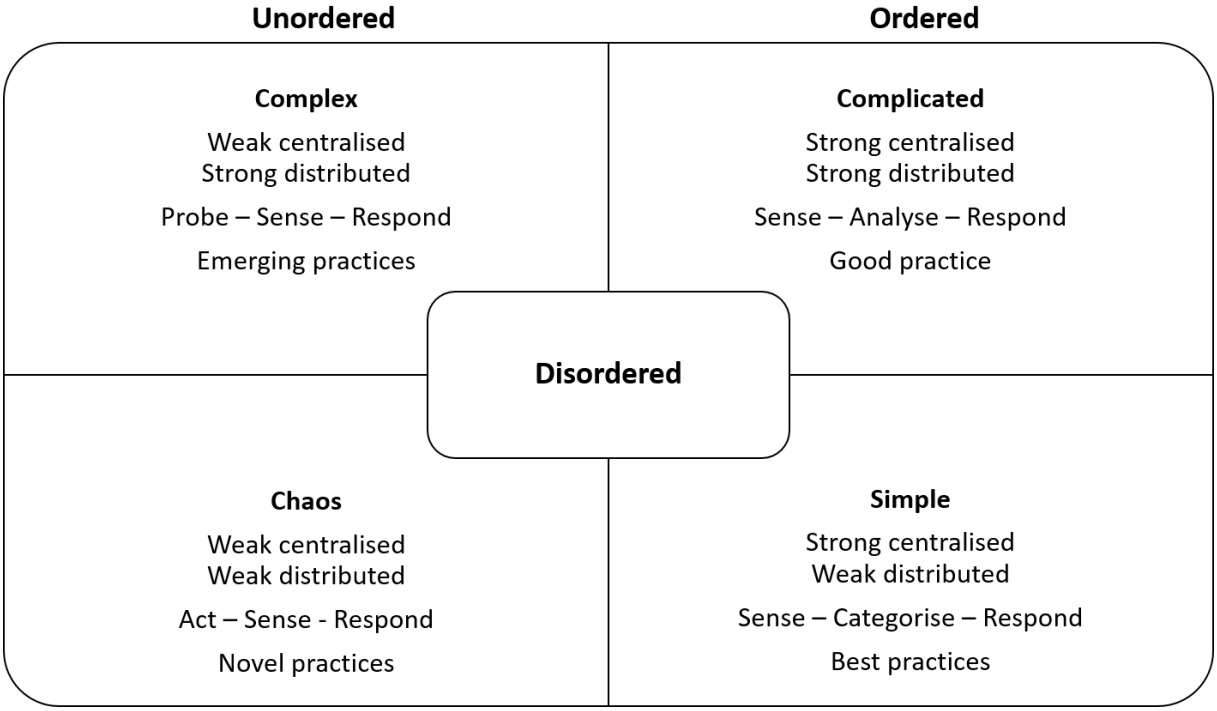


Figure 3.4: Cynefin framework (Snowden, 2002).

The unordered domain distinguishes in two types of situation as well. In the "complex" situation, it is not feasible to determine cause and effect *ex-ante*. However, as events evolve actors may be able to understand how they were initiated, that is, *ex-post*. Consequently, such situation requires a Probe – Sense – Respond (PSR) approach which allows for the development of emergent practices characterised by their weak central and strong distributed connections. Second, the "chaotic" situation illustrates a situation in which it is not feasible to determine cause and effect at all, nor can the actors fully explain what happened even after a major event took place. Thus, central and distributed connections are expected to be both weak and thus result in a state of isolation. By taking Act – Sense – Respond (ASR) as an approach so-called novel practices are discovered.

The last domain of the Cynefin framework is that of disorder and describes a system's condition as destructive. Hence, any form of practice is inapplicable. According to Snowden (2002) this is a potentially dangerous situation which requires immediate action: "while problems may legitimately be allowed to exist

in the other four domains if approached with suitable solutions, those in states of disorder are normally harmful and should be guided into one of the other domains" (p. 8).

Taken together we suggest that:

Proposition 1a:
The uncertainty derived from the internal organisation impacts the predictability of a system's condition.

Proposition 1b:
The uncertainty derived from the external environment impacts the predictability of a system's condition.

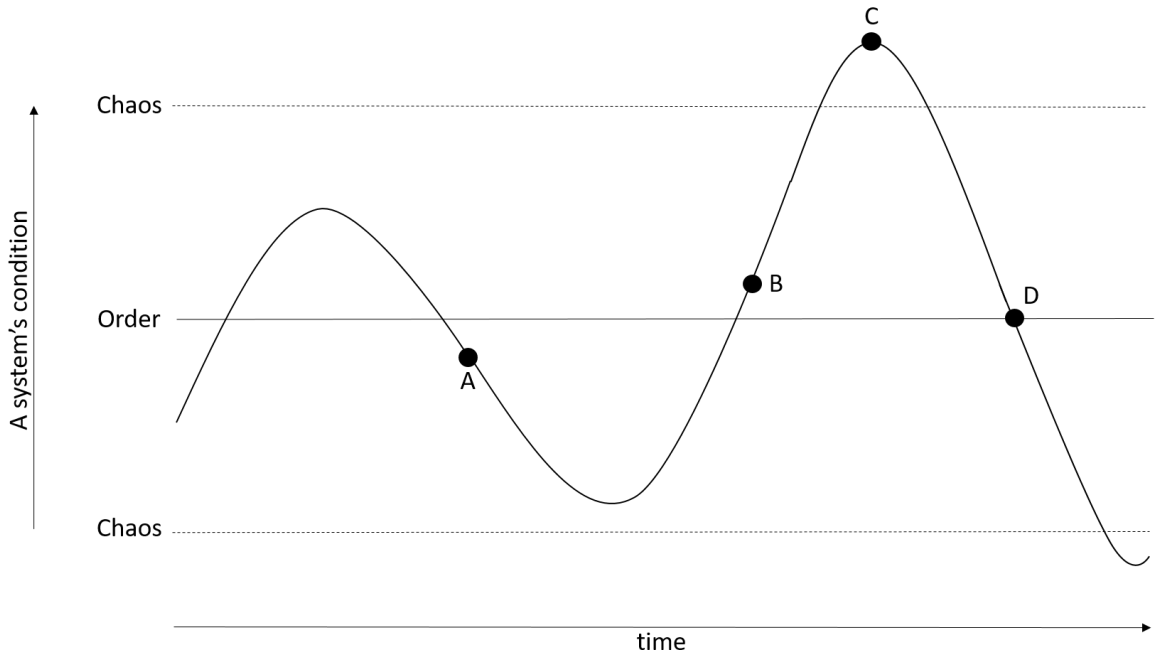
3.5.2 Self-organisation through integration and differentiation

In complex closed systems, in a state of being isolated from its environment and operating deterministically, actors follow the non-linear feedback loops and, therefore, can decide to either conform to (compliance), vary or ignore (resistance) to uncertainty derived from the internal organisation (Wiener, 1948; von Bertalanffy, 1968; Lee et al., 2006). The result of an actor's individual decision, however, is inter-related with those of others in the system. Actors that follow the negative feedback loop demonstrate stable behaviour and subsequently comply with uncertainty derived from the internal organisation. This results in a system that evolves into the ordered conditions. Conversely, in a system where actors follow the positive feedback loop, they demonstrate instable behaviour by deciding to vary or even ignore uncertainty derived from the internal organisation. Consequently, the system will settle down into unordered or, more dangerously, disordered conditions (Wiener, 1948; Ashby, 1956; von Bertalanffy, 1968).

For complex open systems, characterised by a certain degree of interaction with its external environment and operating at most probabilistically, the actors either conform to (compliance), vary or ignore (resistance) to uncertainty derived from the internal organisation as well as the external environment (Capra, 1992; Gell-Mann, 1994; Holland, 1995; Kauffman, 1995). Moreover, uncertainty derived from the external environment can have an impact on the nature and change of uncertainty derived from the internal organisation (Hutzschenreuter and Israel, 2009). Uncertainty derived from the internal organisation can potentially be controlled by management or other means. By contrast, uncertainty derived from the external environment comes from outside the system's boundary and is uncontrollable (Epstein et al., 2012). As a result, the behaviour of the actors can be stable, instable or both. Stacey (1995) defines this type of behaviour as bounded instability. Systems that demonstrate bounded instable behaviour utilise both positive and negative feedback simultaneously, alternating autonomously from one to the other. According to Bousquet (2009) this type of systems have "a sensitive dependency on initial conditions, that is the non-proportionality of cause to effect or input to output" (p. 171). To summarise, the actors in a complex closed system can either demonstrate stable (compliance) or instable (resistance) behaviour, in turn, settling a system into an ordered or unordered condition respectively. Thus, we could say that the predictability of the actors' behaviour (stable or instable) leads to determined (ordered or unordered) outcomes. For complex open

systems, the actors' behaviour is bounded instable (both stable and unstable), in turn impacting a system's condition in a non-linear manner.

As highlighted by Bousquet (2009) systems which demonstrate bounded instable behaviour by utilising non-linear feedback controls have a sensitive dependency on initial conditions. This specifically applies to the element of time since an actor's decision to either demonstrate stable (compliance) or instable (resistance) behaviour has a sensitive dependence to the time it requires for an actor to react to the uncertainty derived from the internal organisation as well as the external environment (Capra, 1992; Gell-Mann, 1994; Holland, 1995; Kauffman, 1995). Following the literature on complexity theory and information processing theory, it becomes clear that the longer it takes for a stabilisation operation to acquire information from either outside the system boundary (i.e. external environment) or from its own behaviour within the system's boundary (i.e. internal organisation) and in relationship to its environment, the more likely the information becomes obsolete (Gell-Mann, 1994; Holland, 1995; Heylighen, 1996; Moffat, 2003). Figure 3.5 illustrates a system's sensitive dependence to the element of time in regards to its response to the uncertainty derived from the environmental conditions.



A: 1st change in environmental conditions which requires organisational response
B: 2nd change in environmental conditions which requires organisational response
C: Information derived from 2nd change in environmental conditions becomes obsolete due to time: system in chaotic condition
D: Return to order due to intervention

Figure 3.5: A system's sensitive dependence to the element of time in regards to its response to the uncertainty derived from the environmental conditions.

To summarise, stabilisation operations are understood as complex open systems composed of multiple sub-systems that interact in a non-linear fashion, in turn impacting a system's condition from inside the system's

boundary. Furthermore, stabilisation operations take place in a highly complex, dynamic and uncertain environment from which it cannot be isolated, thus impacting a system's condition from outside the system's boundary. Moreover, the highly complex, dynamic and uncertain environment impacts the nature and change of the internal organisation. Therefore, we expect that the systems demonstrate bounded instable behaviour (i.e. non-linear feedback mechanism) resulting in the dynamic equilibrium of a system's condition. This behaviour is partly the outcome of intentional choice (i.e. design) and partly determined by environmental conditions.

Therefore, we propose that:

Proposition 2:
The dynamic equilibrium of a system's condition is expected to positively impact its required self-organising ability.

From an organisational perspective, complex systems consist of formal and informal organisations. To better understand the self-organising ability of complex open systems, we need to make a distinction between these two types of organisations. A formal organisation focuses on executing daily operations as efficiently as possible in order to attain the organisation's goals. Therefore, a formal organisation operates according to well-defined command and control structures (Gulati and Puranam, 2009). To sustain its interest of efficiency, a formal system is meant to resist change (Stacey, 1995). As a result, a formal organisation can be found in the ordered conditions of "simple" and "complicated". An informal organisation is best described as an organisation formed within the formal organisation as a network of interpersonal relationships focusing on norms, values and beliefs (Chan, 2002). Both organisations are thus driven by negative feedback controls which generates stable and predictable behaviour. In other words, the formal and informal organisation reinforce each other so that the whole system will settle into ordered conditions. Lawrence and Lorsch (1967) explain this phenomenon as the powerful factor of integration "which is the process of achieving unity of effort among the various sub-systems in the accomplishment of the organisation's task" (p. 4).

Simultaneous from a complex open system's behaviour to settle into the ordered conditions, the powerful factor of differentiation pulls the system in a state of segmentation in which the various sub-systems develop specific (behavioural) characteristics in relationship to its environmental conditions (Lawrence and Lorsch, 1967). Differentiation is thus driven by positive feedback behaviour (Argyris, 1990). Differentiation that impacts the formal system could potentially lead to unordered conditions (Miller, 1990). However, the impact of differentiation is much greater on the informal system as Stacey (1995) explains: "informal systems are a vehicle not only for securing conformity but also for satisfying human desires for excitement and innovation, isolation from their environment, aggression, and individuality (p. 485). Informal systems demonstrating such behaviour could potentially settle the whole system into disordered conditions.

According to Lawrence and Lorsch (1967) an organisation could be seen as "a system of interrelated behaviours of people who are performing a task that has been differentiated into several distinct sub-systems, each sub-system performing a portion of the task, and the efforts of each being integrated to achieve effective performance of the system" (p. 3). Thus, the behaviour of a system should simultaneously be driven by positive and negative feedback mechanisms, resulting in ordered and unordered conditions. Waldrop (1992) defines conditions that balance between order and disorder as complexity: "right between the two extremes [of order and chaos], at a kind of abstract phase transition called "the edge of chaos", you also find *complexity*: a class of behaviours in which the components of a system never quite lock into place, yet never quite dissolve into turbulence, either. These are the systems that are both stable enough to store information, and yet evanescent enough to transmit it. These are the systems that can be organised to perform complex computations, to react to the world, to be spontaneous, adaptive, and alive" (p. 293). This definition of complexity supports the information processing theory from Galbraith (1973) which claims that the degree of uncertainty combined with amount of information to be distributed are to be regarded as a non-linear cause and effect relationship.

To summarise, from an organisational perspective, the formal organisation needs to demonstrate stable behaviour, securing conformity to the well-defined hierarchical structures, rules and procedures in order to conduct daily operations (i.e. driven by negative feedback). Conversely, the informal organisation can potentially demonstrate instable behaviour, promoting change and adaptation to uncertainty derived from the environmental conditions (i.e. driven by positive feedback). In sum, for a system to be changeable it needs to operate in a state of bounded instability driven by non-linear feedback controls.

Connecting these theoretical findings to the Cynefin framework (Snowden, 2002) and the two organisation design strategies presented by Galbraith (1973), we expect that systems that find themselves in the ordered situation of "simple" are mainly driven by negative feedback controls within both the formal and informal organisation. As a result, a single system is expected to be integrated (i.e. strongly centralised) whilst the supra-system will be differentiated (i.e. weakly distributed). Moreover, due to the low-level of uncertainty systems are required to process small amounts of information. Hence, we expect an organisation to act according to strict governance procedures (i.e. low uncertainty). In the situation of "complicated" we propose to find systems whose formal organisation is mainly driven by negative feedback controls while their informal organisation is expected to be mainly driven by positive feedback controls. Hence, we expect to find a single system to be integrated (i.e. strongly centralised) as well as integration within the supra-system (i.e. strongly distributed). In addition, we expect that more information is required to be processed since cause and effect relationships are "complicated", which means that with sufficient time, information and resources, actors should be able to understand these relationships and use them to forecast. Therefore, we expect to find both an increase in information processing capacity through the investment in vertical information systems (i.e. strong centralised) as through the creation of lateral relationships (i.e. strong distributed).

Those systems that find themselves in the unordered situation (i.e. far from equilibrium) of "complex" are expected to be mainly driven by positive feedback controls and hence are expected to be integrated with other systems as part of the supra-system (i.e. weak centralised and strong distributed). Moreover, large amounts of information need to be processed to deal with the high degree of uncertainty and rate of change by which the "complex" situation is characterised. Thus, we expect to find an increase in information processing capacity through the creation of lateral relations (i.e. strong distributed). For systems who find themselves in the "chaotic" situation the Cynefin framework argues for both weak centralised and distributed connections. Therefore, we expect that both the formal and informal organisation are driven by chaotic feedback controls and focus on novel practices. Thus, the systems are expected to be isolated from each other. In order to deal with the high-level uncertainty (i.e. unclear cause and effect relationships) we expect to find systems that focus either on the reduction of information processing needs or on an increase in information processing capacity.

The systems that are facing the disordered domain are expected to remain the *status quo* until they are pushed into one of the other domains by self-organisation or management efforts.

Taken together, we suggest that:

Proposition 3:
A system in dynamic equilibrium is expected to be mainly driven by non-linear feedback controls, thereby enabling its required self-organising ability to either differentiate or integrate.

Figure 3.6 offers an illustration of the above propositions added to the Cynefin framework.

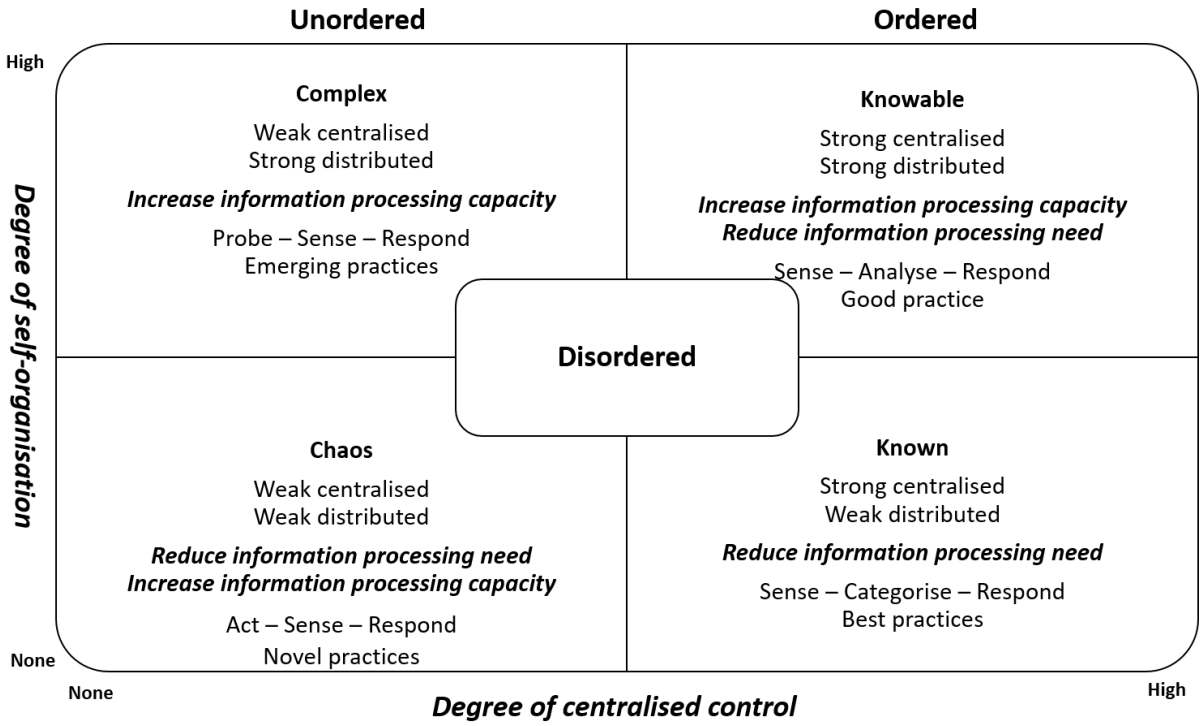


Figure 3.6: Proposition 2 and 3 added to the Cynefin framework.

3.5.3 Condition-dependent capabilities

At the core of the conceptual model presented in section 3.2 lies the concept of a system's self-organising ability to either differentiate or integrate its sub-systems, organisational resources and competencies, subsequently resulting in the development of condition-dependent capabilities (i.e. new organisational forms which emerge and adapt). Amit and Schoemaker (1993) define organisational resources as "stocks of available factors that are owned or controlled by the firm" (p. 35). Competencies refer to "a firm's capacity to deploy resources, usually in combination, using organisational processes, to effect a desired end" (p. 35) and are therefore defined as "…a bundle of skills and technologies rather than a single, discrete skill or technology" (Hamel and Prahalad, 1994, p. 202). Capabilities, in turn, refer the use and deployment of these competencies in order to attain organisational objectives (McGrath et al., 1995; Teece et al., 1997).

Condition-dependent capabilities include sub-system, system and supra-system capabilities. Sub-system capabilities are the high-level routines that are formed through the relationships between the organisational resources and competencies from a single sub-system. System capabilities are the high-level routines (or a collection of routines) that are formed through the relationships between the organisational resources and competencies of multiple sub-systems. Supra-system capabilities are the high-level routines (or a collection of routines) comprised of two or more organisational resources and competencies in a relationship. From a system's perspective, supra-system capabilities are intentionally developed (i.e. by design) or emergent capabilities (i.e. emergence and self-organisation) that are possessed by neither one of the contributing

systems in isolation, nor already existing capabilities with previously unattainable values (Nevo and Wade, 2010).

The outcomes derived from the development of supra-system capabilities can be negative, neutral, or positive (Orlikowski, 2000). This is actor dependent (Churchman, 1971). In other words, supra-system capabilities can serve the purpose of a certain actor (i.e. positive) while failing to do so for another actor (i.e. negative). Nevo and Wade (2011) suggest that the development of emergent capabilities are determined by a system's goal. Ackoff (1971) defines a system's goal as "a preferred outcome that can be obtained within a specific time period" (p. 666). Since we expect that the various systems share the common goal of stabilisation and recovery, we consider the development of emergent capabilities as positive emergent capabilities. However, although the systems share the common goal of stabilisation, the development of emergent capabilities could be hampered when the *ex-ante* assessment indicates that interaction is either not feasible or desirable, or both. This results in the development of system capabilities or even sub-system capabilities when the relationships within a single system are neither feasible nor desirable, or both.

Hence, we propose the following:

Proposition 4:
A system's self-organising ability to differentiate and integrate positively impacts the development of condition-dependent capabilities.

3.5.4 Outcomes

We differentiate between two types of outcomes that could be obtained by condition-dependent capabilities, namely strategic or operational (Subramani, 2004; Graighead et al., 2006). However, stabilisation operations often deal with 'ill-structured' problems (Rietjens and De Waard, 2017), as opposed to 'structured problems' (Dunn, 2012). Rittel and Weber (1973) made the distinction between 'tame' and 'wicked problems', whereas the latter are "problems that are ill-defined, several, conflicting criteria for solution definition, solutions which create further problems and no obvious indications of when enough has been achieved (p. 155). 'Wicked problems' are characterised by the number of actors involved. While actors share a common goal, they often must cope with extreme cultural differences causing daily friction and behave strategically to maximise their own interests and subscribe to different priorities (Enserink et al., 2010). Consequently, the many actors involved may not agree on what the main problem is, may subscribe to different priorities and preferences for particular solutions. Moreover, any one of these multiple actors may change its views over time. Thus, although we argue that condition-dependent capabilities positively impact the generated outcomes they will be ill-defined, impacts will be difficult to measure and actor dependent.

Proposition 5:

The development of condition-dependent capabilities positively impact the attainment of outcomes, yet, policy impacts will be difficult to measure and actor dependent.

3.6 CHAPTER SUMMARY

The insights gained from the presentation of the initial conceptual model enables us to better structure the empirical part of this study. By identifying the constructs that are relevant for this study, providing their definitions and concluding with the presentation and justification of the initial propositions we offer an initial design to cope more effectively with the complexity of multi-actor interaction during stabilisation operations.

As described in chapter 1, this study combines two research methods of solution-orientated research, namely design science (Romme, 2003; Hevner et al., 2004) and case study research (Yin, 2014). Design science has the goal of creating knowledge (i.e. design artefact) that practitioners can apply to gain understanding of real-world problems and their potential solutions (Hevner et al., 2004). Moreover, since this process is iterative it should be repeated several times. Hence, the evaluation of the design artefact is realised through the application of the initial conceptual model to two case studies. Each case study is considered a single iteration including the analysis of the identified problem, application of the conceptual model to the respective case, generate findings and recommendations for design improvement. Ultimately, the conceptual model will be finalised and introduces complex systems thinking as an alternative for the strategic modelling of stabilisation operations to cope more effectively with the complexity of multi-actor interaction and supporting the debate over the extent to which integration is feasible and desirable.

Before we can examine the findings from the two real-world case studies it is essential to take a detailed look into the research methodology and design applied to analyse the conceptual model. The combination of the two research methods is presented in chapter 4.

4

Research method

"All I'm armed with is research".

- *Mike Wallace (1950)*

4.1 INTRODUCTION

In chapter 3 we introduced the initial conceptual model for this study and presented the preliminary propositions. The aim of this chapter is to offer a detailed insight of the research method applied to evaluate the initial conceptual model. By describing the research method, readers can read through the narrative of the research method and thereby offering the potential to recreate this study. In addition, this chapter also describes the methodological justification of the research methodology selected for this study.

This chapter will continue as follows. In 4.2 we provide an overview of the research design and explain its relationship to complexity and systems theory as well as information systems (IS) research. The outline of the empirical part of this dissertation, namely the data collection and analysis of the two case studies, is described in section 4.3 and 4.4 respectively. We conclude in section 4.5 by explaining the research quality of this research.

4.2 RESEARCH DESIGN

4.2.1 Design science research

Research paradigms. The field of systems theory and IS research can be characterised by two main paradigms, namely behavioural science and design science. Behavioural science is focused on adding value to the human or organisational behaviour knowledge base through the development and verification of theories. As described by Hevner et al. (2004) design science goes a step further and seeks "to extend the boundaries of human and organisational boundaries by creating new and innovative artefacts" (p. 75). Both research paradigms are closely related to complexity and systems theory as well as IS research since the field is a conflux of people, organisations and technology and are illustrated in figure 4.1. However, an important distinction needs to be made. Behavioural science is aims to explain or predict certain phenomena in relationship to the research gap. Design science takes a different approach by seeking to fulfil the research gap by the building and designing of artefacts. In other words, whereas the goal of the former is 'seeking the truth', the goal of the latter is utility. According to Hevner et al. (2004) design science is particularly

relevant in studies which address so-called 'wicked problems' which are "problems that are ill-defined, several, conflicting criteria for solution definition, solutions which create further problems and no obvious indications of when enough has been achieved (Rittel and Weber, p. 155). Hence, we selected the design science paradigm for this study by which we aim to gain a better insight of the identified research objectives and their potential solutions through the development and evaluation of the design artefact, namely the initial conceptual model which we have described in the previous chapter.

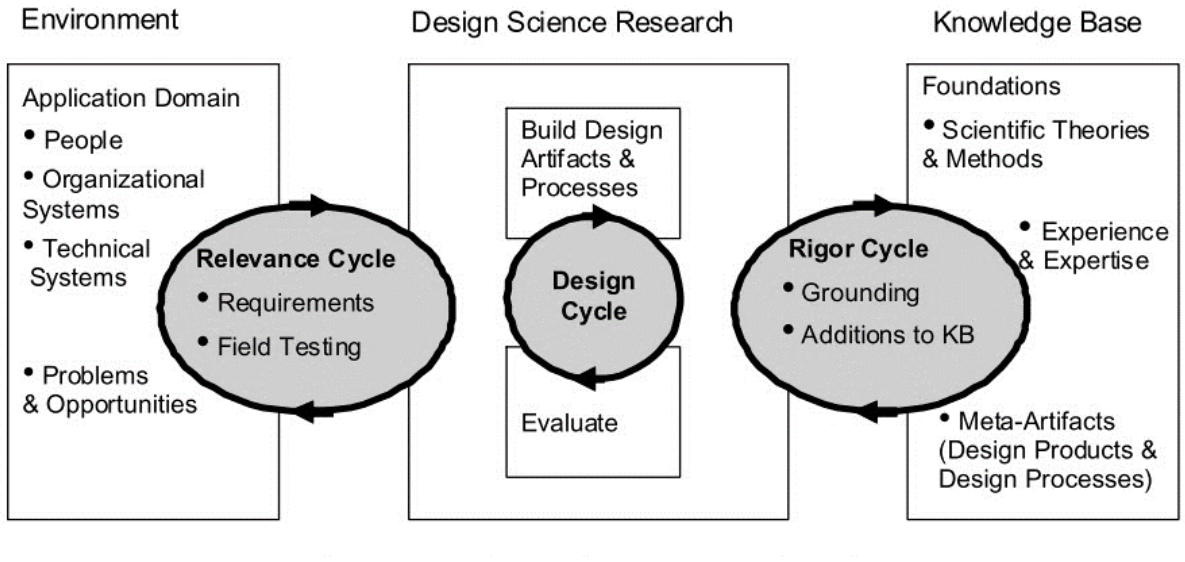


Figure 4.1: Information Systems Research Framework. Source: adapted from Hevner et al. (2004).

Design process. Design science consists of two main elements, namely a process (evaluation) and a product (conceptual model) (Walls et al., 1992; Romme, 2003; Hevner et al., 2004). The process can be regarded as an expert activity or sets of expert activities that aims at developing the product, namely the design artefact. By constantly alternating between processes and artefact, design science supports complex problem solving. In other words, once the artefact is designed it will provide information feedback over both the artefact itself as well as the process. This process can be viewed of as circular and should be repeated several times in order to enable the development of the final model (Markus et al., 2002).

Following March and Smith (1995) two distinct processes, namely development and evaluation can be distinguished Design artefacts are built to solve the identified problem and subsequently evaluated in relationship to the utility provided by the design artefact as solution to the respected problem. Additionally, four design artefacts, namely constructs, models, methods and instantiations were identified. Problems and solutions are defined and explained by using constructs (Schön, 1983), whereas conceptual models intent to represent the research problem as well as its potential solution as a 'real world' situation (Simon, 1996). Methods are used to offer guidelines for exploring the solution space in order to solve the problem. Finally, instantiations are illustrating the feasibility of a design artefact by enabling an *ex-post* assessment of the design artefacts utility (Hevner et al., 2004). In this study, we applied design science for a very specific and unique purpose, namely defining and evaluating a theory for multi-actor interaction during stabilisation operations.

By defining a set of ground rules we intend to facilitate a focused discussion about the strategic modelling of stabilisation operations from a complex systems perspective.

Guidelines for design science. By now we understand that design science is a process that aims for problem-solving. In order to support these processes, Hevner et al. (2004) presented seven guidelines that are fundamentally inter-related to "the knowledge and understanding of a design problem and its solution that are acquired in the building and application of an artefact (p. 82). Table 4.1 illustrates the seven guidelines and offers a description for each of them.

Table 4.1: Design science research guidelines. Source: adapted from Hevner et al. (2004).

Guideline	Description
Design as an artefact	Design science research must produce a viable artefact in the form of a construct, a model, a method, or an instantiation.
Problem relevance	The objective of design science research is to develop technology-based solutions to important and relevant business problems.
Design evaluation	The utility, quality, and efficacy of a design artefact must be rigorously demonstrated via well-executed evaluation methods.
Research contributions	Effective design science research must provide clear and verifiable contributions in the areas of the design artefact, design foundations, and/or design methodologies.
Research rigor	Design science research relies upon the application of rigorous methods in both the construction and evaluation of the design artefact.
Design as search process	The search for an effective artefact requires utilising available means to reach desired ends while satisfying laws in the problem environment.

4.2.2 Case study research

The explorative character of this research is best supported by a qualitative research design. This type of research design can offer insights of the behaviour of actors and the way their inter-relationships emerge and evolve (Teijlingen, 2014). These phenomena are descriptive in nature and hence difficult to quantify (Hove and Anda, 2005; Sekaran and Bougie, 2013). Moreover, a qualitative research strategy is argued to help better understand detailed and contextual data (van der Kuijt, 2013). Since we view stabilisation operations as complex open systems characterised by its uncertain environmental conditions, we propose a qualitative research design as best suitable for this specific research objective.

In line with the qualitative research design, an appropriate research method needs to be developed. According to Yin (2014) there are 4 conditions that offer an indication if case study research is a suitable design:

1. The research is characterised by a research question that can be defined as "how" or "why" question;
2. It is not feasible to manipulate the behaviour of the participants;
3. The contextual characteristics of the research are very relevant;
4. One deals with unclear boundaries between the context and phenomena.

This study aims at the analysis of the conceptual model and therefore should be conducted in the context where it operates. In other words, this study does not require to control the environment and thus can be conducted in a non-contrived setting. Hence, selecting real-world case studies is best suited to match this criteria. For this study, case study research is the primary source to collect empirical evidence that enables us to evaluate the initial conceptual model. Following design science research, it is important to select suitable case studies that will correspond with the research objective of this study (Baxter and Jack, 2008). With respect to presenting complexity and systems thinking as an alternative for the strategic modelling of stabilisation operations, the case studies are explanatory and descriptive. When applied to the case studies, the conceptual model explores and describes how to cope more effectively with the complexity of multi-actor interaction during stabilisation operations and supports the debate over the extent to which integration is feasible and desirable.

Following Yin (2014), we adopted a multiple case study design that enables researchers to identify differences within and between different cases. For the purpose of literal replication (i.e. generalisability), we applied the conceptual model to two cases. By exploring complex systems thinking as an alternative for the strategic modelling in different cases enables us to compare different settings and gaps in the conceptual model.

4.2.3 Unit of analysis

When applying systems theory, it is important to be precise in determining the system boundaries as well as the level of analysis. According to Kast and Rosenzweig (1972) "there is a tendency for writers in organisational theory to accept general systems theory and then move indiscriminately across systems boundaries and between levels of systems without being very precise" (p. 455). The need for the clear delineation of the level of analysis when applying systems theory is further stressed by Miller (1965) "it is important to follow one procedural rule in systems theory in order to avoid confusion. Every discussion should begin with an identification of the level of reference, and the discourse should not change to another level without a specific statement that this is occurring" (p. 216).

In this study we defined the complex system as the primary unit of analysis in this study. In other words, the complex interactions of the many actors involved in stabilisation operations whose efforts are to be integrated in order to achieve unity of effort. As we learned in chapter 2, a complex system is formed around various distinct sub-systems. Conversely, a complex system is to be part of a larger supra-system (Scott, 1961; Simon, 1969; Banathy, 1992).

In this study we view stabilisation operations as complex systems differentiated into various sub-systems and part of a supra-system. Hence, the unit of analysis is twofold: first, we focus on the multi-actor interaction between the sub-systems of a stabilisation operation (i.e. within a single system). Second, we study the multi-actor interaction between a stabilisation operation and the other systems as part of the greater supra-system.

4.3 DATA COLLECTION

4.3.1 Case study: Task Force Uruzgan

The objective for the first case study is twofold. First, it serves as the first analysis of the initial conceptual model. Additionally, the results derived from the content analysis are used to complement the theoretical understanding of the preliminary propositions which illustrate the causal relationships between the constructs. Following Yin's (2014) case study approach, we applied the initial conceptual model to the first case study of multi-actor interaction and information processing, namely within the Task Force Uruzgan (TFU) a sub-component of the International Security Assistance Force (ISAF), and between the TFU and actors involved in Afghanistan. Out of the great number of stabilisation operations conducted at the time of this study, we selected the TFU mission because it included a large coalition and had a clear integrated and comprehensive approach as organisational design (NATO, 2008). The TFU mission was operational between 2006 and 2010.

The characteristics of the case study were:

- Presenting a general analysis of the conceptual model;
- The interviewees should have been actively engaged in the TFU;
- The interviewees should be familiar with the organisational design and information processing of the TFU.

The characteristics of the TFU case study are presented in table 4.2.

Table 4.2: Characteristics of the TFU case study.

Case study	Distinctive feature of case study	Participating sub-system	Role of each sub-system	No. of interviewees
Task Force Uruzgan	General analysis of the conceptual model	TFU Headquarters (TFU HQ)	Command and Control	14
		Battle Group (BG)	Defence (security)	5
		Provincial Reconstruction Team (PRT)	Diplomacy and Development	6

To develop a comprehensive understanding of the phenomena investigated, data collection relied on multiple sources (see table 4.3). First, various documents including operations orders, after action reviews, daily and weekly TFU Headquarters (TFU HQ) reports, Provincial Reconstruction Team (PRT) project information and liaison reports with detailed information on the TFU were studied. This provided us some greater insight into the environmental conditions of the mission.

Subsequently the interview protocol was developed. Interview data is a common source in qualitative case study research (Sekeran and Bougie, 2013; Yin, 2014). Such data is considered valuable since it includes the experiences (i.e. stories, opinions and actions) of the respondents. Hence, interview data and particularly when collected during a field trip is regarded as a rich and unique form of qualitative data (Hove and Anda, 2005). When conducting interviews, it is critical to understand that collecting the data is a mere interpretation of the respondent's vision of the real world (Yin, 2014). Hence, the data collected could be characterised by a certain level of response bias. To reduce the risk of bias entering the data triangulation is used. The application of triangulation will be discussed in section 4.5.

In this study, we used semi-structured interviews that typically include many open questions (Hove and Anda, 2005). The purpose of an interview protocol is to give some form of structure and direction to the interview. However, since we were interested to hear the experiences of the respondents, semi-structured interviews were applied the TFU case study. We conducted the interviews in isolation, that is, they were taken place in a situation where both the interviewer and the interviewee were solely present in one physical location. The interviews were audio-recorded and held in English.

An important aspect of research is source protection. This is particularly relevant when studying stabilisation operations that are known for their high-level of confidentiality. Therefore, we try to keep the respondents as anonymous as possible. Consequently, quotes are solely traceable back to the respective sub-system and a functional position, not an individual. Source protection is also applied in the data analyses. We labelled each respondent by its given job description which was then used as the primary identification factor in the coding process.

The interview questions were developed upon the insights gained from the literature review and document analysis, and were derived to the preliminary propositions of the initial conceptual model. Thus, we applied a relatively tight, more deductive approach by working with well-delineated constructs with the purpose of providing clarity and focus (Miles and Huberman, 1994; Shields and Rangarajan, 2013). Conversely, while conducting the semi-structured interviews we developed new insights into the domain of study which were highly valuable for explanation building. Those insights were added to the development of the conceptual model (i.e. derived from the environment) which materialised slowly but surely in the course of this study. In other words, we applied a more semi-structured, grounded theory approach to the data collection (Miles and Huberman, 1994. This intermediate approach, which combines a pre-structured as well as a loose and emergent approach is known as abduction (Richardson and Kramer, 2006).

After reviewing and testing the initial version of the interview protocol several improvements were made. The final version of the interview protocol can be found in appendix A2. We conducted a total of 25 in-depth interviews with representatives of the TFU's sub-systems (appendix A1). The participants were selected based on their seniority and the nature of their responsibilities in the various sub-systems of the TFU. The interviews were held in the period from November 2014 and October 2015 and took place in the Netherlands, Germany and France.

Table 4.3: Data collection

Source of data collection	Expected output
Semi-structured interviews with representatives of the TFU's sub-systems	- Cause and effect relationships of the uncertainty derived from the environmental conditions - Specifics of a system's predictability - Information processing - Condition-dependent capabilities
Operational documentation (e.g. operations orders, after action reviews, daily and weekly TFU HQ reports)	- General inter-relationships perspective - Specifics of a system's predictability - Organisational resources, competencies and capabilities
PRT project information and liaison reports	- Information processing - General inter-relationships perspective - Organisational resources, competencies and capabilities

4.3.2 Case study: United Nations Multidimensional Integrated Stabilisation Mission in Mali

Design science can be viewed of as circular and should be repeated several times in order to enable the development of the final model (Markus et al., 2002). Therefore, the second case study, the United Nations Multidimensional Integrated Stabilisation Mission in Mali (UN MINUSMA), elaborates on the first case study by presenting a second analysis of the conceptual model in order to further shape it as potential solution to the respected problem. Moreover, a study that aims at investigating the complexity of multi-actor interaction during stabilisation operations should be undertaken in the operating environment where the mission itself is conducted and needs to get as close (in both time and space) to the dynamic events that take place in the operating environment. Therefore, data should be collected in the field. An important aspect to consider hereby is the difficulty of accessibility to the respected area. My employer, the Ministry of Defence of the Netherlands, offered me a unique opportunity to collect field data and study the complexity of multi-actor interaction during stabilisation operations in more detail. The data was collected during an extensive fieldtrip in northern Mali from December 2015 until April 2016 and took place on the UN camps in Gao and Kidal. It provided us with unique insights in the complexity of multi-actor interaction during stabilisation operations, observed through the eyes of a very unique group of practitioners. The fieldtrip was characterised by a highly instable security situation in which several attacks were executed on the UN troops while patrolling the area as well as more complex attacks against the UN camp in Kidal. Hence, from the perspective of complexity theory one could truly say that the data collection took place at 'the edge of chaos'.

The characteristics of the case study were:

- Presenting a general analysis of the conceptual model;
- The interviewees should have been actively engaged in UN MINUSMA;

- The interviewees should be familiar with the organisational design and information processing of UN MINSUMA.

The characteristics of the UN MINUSMA case study are presented in table 4.4.

Table 4.4: Characteristics of the selected case study.

Case study	Distinctive feature of case study	Participating sub-systems	Role of each sub-system	No. of interviewees
UN MINUSMA	General analyses of the conceptual model	UN civilian staff	Stabilisation and recovery; rule of law; Human Rights.	10
		UN military staff	Security; Advise and assist in reconstruction	10
		UN police force staff	Mentoring and joint patrolling with the Malian police force	5

We first studied various operations orders, CIMIC reports as well as other UN MINUSMA documentation to create a more general insight of the UN MINUSMA mission. This provided us insight in the organisational structure of UN MINUSMA which in turn enabled us to select the ideal participants for the interviews. What followed was the development of the measurement instrument which followed the same structure as applied in the TFU case study, namely an abduction (Richardson and Kramer, 2006). Hence, the interview protocol was developed upon the insights gained from the first case study. Additionally, while conducting the semi-structured interviews we developed new insights into the domain of study which were highly valuable for explanation building. Those insights were added to the development of the conceptual model which materialised slowly but surely in the course of this study. In other words, we applied a more semi-structured, grounded theory approach to the data collection. After reviewing and testing the initial version of the interview protocol several improvements were made. The final version of the protocol can be found in appendix A4.

Shortly after the finalisation of the measurement instrument we started the field work. Upon arrival in Mali, we first identified the potential participants and scheduled appointments for the interviews. Additionally, we arranged permission to participate, as an observer, in the various meetings of the sub-systems. In sum, the data collection consisted of 25 semi-structured interviews, participative and direct observation during civil-military activities, daily staff meetings, security- and development coordination meetings as well as informal talks with the members of the sub-systems of UN MINUSMA (see table 4.5). Senior members of UN MINUMSA while being deployed into northern Mali participated to the interviews (see appendix A3). Each interviewee represents a sub-system of the mission, namely UN civilian staff, UN military staff and UN police force staff.

Table 4.5: Data collection.

Source of data collection	Expected output
Semi-structured interviews with representatives of UN MINUSMA sub-systems	- Cause and effect relationships of the uncertainty derived from the environmental conditions - Specifics of a system's predictability - Information processing - Condition-dependent capabilities
Operational documentation (e.g. operations orders, after action reviews, daily and weekly UN MINUSMA reports)	- General inter-relationships perspective - Specifics of a system's predictability - Organisational resources, competencies and capabilities
CIMIC project information and liaison reports	- Information processing - General inter-relationships perspective - Organisational resources, competencies and capabilities
Daily participative and direct observations during security- and development coordination meetings of members of the sub-systems	- Cause and effect relationships of the uncertainty derived from the environmental conditions - Specifics of a system's predictability - Information processing - Condition-dependent capabilities

4.4 DATA ANALYSIS

The interview protocols for the semi-structured interviews served as measurement instruments for the analysis of the conceptual model. To demonstrate how values are measured and determined, operationalisation of the constructs is essential (Verschuren and Doorewaard, 1999). The constructs are converted into operational variables to achieve the desired level of detail (Bacharach, 1989). Finally, we converted the operational variables into a number of indicators which could be measured (Segers and Hagenaars, 1990). Hence, the measurable indicators are most concrete and offer a detailed understanding of the constructs and are were therefore critical for the development of the measurement instrument. We used the findings from the literature study (i.e. definitions and operationalisations) to develop the measurable indicators (Zmud and Boynton, 1991).

While conducting the semi-structured interviews, we were able to develop new insights into the domain of study which were highly valuable for explanation building. Those insights were added to the development of the conceptual model (i.e. derived from the environment) but were not initially included in the interview protocol. The richness of initial conceptual model (including constructs, operational variables and measurable indicators) and the insights gained while conducting the semi-structured interviews perfectly illustrates the essence of design science, namely alternating between the knowledge base and environment.

Table 4.6 presents an overview of this process.

Table 4.6: Characteristics of the measurement instrument.

Construct	Variables	Indicators	References

Internal organisation	Strategic model	1. Business strategy (WAYS) 2. Organisational strategy (MEANS) 3. Information strategy (WAYS + MEANS)	Snowden (2002) Kurtz and Snowden (2003)
	System diversity	1. Time orientation 2. Interpersonal orientation 3. Goals orientation	Williams and O'Reilly (1998) Van Knippenberg and Schippers (2006)
External environment	Operating environment	1. Rate of change in environmental conditions 2. Certainty of information at a given time about the environment 3. Time span of definitive feedback from the environment	Gleick (1987) Shafer (1988) Prigogine (1996)
A system's condition	Simple	1. Degree of centralised control 2. Degree of self-organisation 3. Information processing capacity 4. Type of practice	Snowden (2002) Kurtz and Snowden (2003) Galbraith (1974)
	Complicated	1. Degree of centralised control 2. Degree of self-organisation 3. Information processing capacity 4. Type of practice	
	Complex	1. Degree of centralised control 2. Degree of self-organisation 3. Information processing capacity 4. Type of practice	
	Chaotic	1. Degree of centralised control 2. Degree of self-organisation 3. Information processing capacity 4. Type of practice	
	Disordered	1. Degree of centralised control 2. Degree of self-organisation 3. Information processing capacity 4. Type of practice	
			Waldrop (1992)

Required self-organising ability	Differentiation	1.	Compatibility	Gell-Mann (1994)
		2.	Integration effort	Holland (1995)
				Stacey (1995)
	Integration	1.	Compatibility	Orlikowski (2000)
		2.	Integration effort	Nevo and Wade (2010)
Condition-dependent capabilities	Sub-system capabilities	1.	Integrated	Lawrence and Lorsch (1967)
		2.	Differentiated	
	System capabilities	1.	Integrated	Orlikowski (2000)
		2.	Differentiated	Nevo and Wade (2010)
	Supra-system capabilities	1.	Integrated	
		2.	Differentiated	
Outcomes	Operational	1.	Tangible	Subramani (2004) Craighead et al. (2006)
		2.	Intangible	
	Strategic	1.	Tangible	Rittel and Weber (1973)
		2.	Intangible	

Once the interviews were transcribed (see Appendix A6), the data analysis took place. Data analysis is best understood as the process of examining the empirical evidence so that the findings can be presented (Yin, 2014). Following Yin (2014), four strategies for data analysis in case studies can be distinguished, namely relying on theoretical propositions, working with data from the ground up, developing a case description and examining plausible rival explanations. For this research, we applied the strategy of relying on theoretical propositions that are presented in the conceptual model (chapter 3). This strategy provides an inductive approach for data analyses and suits best the explorative character of this study. A suitable method for implementing such an approach is content analysis.

Content analysis allows for several sub-sequent steps to take in order to present the empirical finding. First, the interview transcripts are divided into smaller manageable categories (e.g. words, sentences and themes). These smaller manageable categories are subsequently analysed by using conceptual analysis, which in turn identifies the occurrence of either explicit or implicit concepts within the text. When presenting the results of our findings in chapter 5 and 6 respectively, aggregated coding data derived from the content analysis is combined with individual responses in the form of quotes. This was subsequently compared with the theoretical preliminary propositions presented in chapter 3, thereby embedding this research in practice by providing rich set of narratives and data for cross-case synthesis and explanation building.

We subsequently compared the smaller manageable categories from the respondents of the TFU with those of UN MINUSMA. We devoted particular attention to the commonalities between the participants of both case studies involved extensive tagging for each construct (one or more quotes) of interview data, using the interviewees' responses. The purpose of this comparison was to support the cross-case analysis which is presented in chapter 7 and aims at presenting the commonalities across the participants. By combining within- and across-case analysis we intended to enable the process of intuiting which relates to the identification and thorough reflection of the smaller manageable categories (i.e. particularly themes) that

could be found in the responses of multiple respondents (Swanson et al., 1988). The cross-case analysis, in turn, serves the purpose of literal replication (i.e. generalisability).

Since design science can be viewed of as circular and should be repeated several times in order to enable the development of the final model (Markus et al., 2002), we presented the final conceptual model to 5 senior members of the Ministry of Defence and Ministry of Foreign Affairs of the Netherlands (see appendix A5). One could consider this an *ex-post* analysis of the conceptual model to provide the final information feedback over both the model itself as well as the process for explanation building.

4.5 RESEARCH QUALITY

An important challenge in case study research is to manage the tension between the realisation of the richness that characterises this study, and conforming to the standards of unbiased and rigorous research (Ahrens & Chapman, 2006; Lillis, 2008; Yin, 2014). Such a balance can be achieved through a thorough research design and conformation to several research criteria, namely validity, reliability and usability (Yin, 2014). First, validity is related to the operationalisation of theoretical constructs and variables, the way their propositions and hypothesis are evaluated, and to which the research is generalisable to theory and practice. Second, reliability contains those actions taken by the researcher to minimise error and bias in the research. Third and finally, usability reflects the applied research character of this study and addresses how practitioners can use the results of this study in practice (Lillis, 2008; Yin, 2014). We undertook several actions to increase the validity, reliability and usability of this research.

In order to increase the construct validity of this study we applied data triangulation during the data collection phase. Data triangulation involves the usage of several distinct sources (Mathison, 1988; Sekaran and Bougie, 2013). Yin (2014) argues that in almost every case study the results are "likely to be more convincing and accurate if [they] are based on several different sources of information" (p. 116). In this study, data collection included semi-structured interviews, participative observation and document analysis. By carefully documenting the empirical evidence which was collected during the field work, we should be able to allow readers to connect the research aim and questions to the conclusions and vice-versa.

Investigator triangulation was applied throughout the data analysis phase that strengthen the internal validity of this study. Two additional experienced researchers (i.e. a full professor and a PhD researcher, both employed by Tilburg University) coded in an iterative manner, the data collected, thereby providing a validity check on the data (Yin, 2014). We applied theme coding (Gioia and Thomas, 1996) for the operationalisation of the constructs. This pertains to the broad constructs that are converted into operational variables and subsequently measurable indicators (Bacharach, 1989; Segers and Hagenaars, 1990) by grouping them in a data matrix (see appendix A7). Coding was applied by tagging each construct (i.e. quotes) of interview data, using the interviewees' responses. In table 4.7 we illustrate an example of a construct that is converted into an operational variable and subsequently measurable indicator and its corresponding quotes.

Table 4.7: Example of coding strategy.

Construct	Operational variable	Measurable indicator	Quote
			"Of course some are saying it's taking too long, there's some critique which says slow impact project because the funding comes slowly. So for them it's never going fast enough and from their perspective they are asking the local government why it is taking so long".
		Time orientation	"Another problem is the fact that most UN civilian employees work with minimal a two year contract and sometimes try to be here for three years depending on their mission. So there's not an urgency and they can take a long slow development approach to it and unfortunately since my focus area is security and helping the security of the force it creates conflict since the two go hand in hand".
Internal organisation	System diversity		
		Interpersonal orientation	"Some international NGO's who according to their raison d'être are humanitarian and therefore should not be seen anywhere near someone in uniform or an organization that is involved with the military".
			"They don't understand the security situation changes and if we don't react now the situation can go out of control. They don't change their paths and are not very flexible unless the SRSG steps in and says we need to change focus".
		Goal orientation	"The Force Commander puts out his quarterly guidance and the C-SHQ-E adjusts it then for his region. I take that adjusted guidance, specifically the CIMIC guidelines for me to follow and I develop a plan, which is usually a plan with four lines of operation. The first line is CIMIC operations like QIP's and projects in areas of interest, the second one is coordination with civilians, and the third one is information operations. The last one is education.
			"Then the goals which are basically the objectives of the mission, almost 50 to 60 % can't be implemented due to this unique situation in the Kidal region".

Typically, stabilisation operations are characterised by their differences in terms of their physical environment (e.g. terrain, weather) as well as cultural aspects, thereby limiting the external validity of this research. In an attempt to increase the external validity we selected a multiple case study design which enables literal replication. For example, not only did we study the self-organising ability of a stabilisation operation to differentiate and integrate its resources within a NATO context, but we also studied this phenomenon in a UN context.

In addition to the two types of triangulation, a case study protocol was developed describing the measurement instrument, procedures and general rules which were followed during this research. The protocols acted as a road map during the research process and increased the reliability of this study (Yin, 2014). Moreover, to establish a coherent approach the process we applied the same structure to both interview protocol as well as content analysis.

Nevertheless, investigator bias remains a critical element in this study. As a military officer, I am an active member of a sub-system of study and in that role was part of both the TFU and UN MINUSMA mission. A comparable situation can be found with embedded journalist Joeri Boom while reporting about the TFU. In his book, Boom (2010) describes his situation as: "…my identification with the team undermines my position as an independent reporter step by step" (p. 136). Boom decided to simply accept the bias because there was no other option. The security situation in Uruzgan was so fragile that he could simply not travel without the protection of a military unit.

Discussion takes place amongst scholars whether or not researchers can act as an unbiased tool (Schwartz and Green-Swartz, 1955; DeWalt et al., 1998; Boeije, 2010). Since I was a military officer who participated in both missions personally, most interviewees 'labelled' me at least an 'accepted marginal member' (Foster, 1996). As a result, a lot of non-research related talks took place which increased the quality of the data. Some interviewees stated that they would never let the researcher participate in their daily coordination meetings, security briefings and the regular day-to-day work if they did not know the researcher for so long and trusted him. However, according to DeWalt et al. (1998) being an 'accepted marginal member' leads to a paradox: "yes you want to understand the natives, but you do not want to go native" (p. 263).

I believe that my personal circumstances, to some extent, have influenced the reliability of this study due to the insider – outsider perspective. As a result, over-reporting (i.e. observer bias), selective perception and selective recall may have influenced the data collection and analysis. To reduce investigator bias and thereby enhance the reliability I have tried to be critical by identifying, analysing and describing a situation without qualifying it as good or bad. Moreover, to the interviewees I often mentioned that although I am a military officer myself, for the purpose of this study I am an independent researcher affiliated to Tilburg University and the Netherlands Defence Academy.

Finally, this study has been conducted in accordance with the code of ethics for research (Tilburg University, 2018). This includes methodology and protection of data and privacy of participants. In short, all data is anonymised for privacy purposes of the participants. Furthermore, the complete dataset is stored through the Research Data Office of Tilburg University in a protected digital environment. According to the policy for research data management of Tilburg University[3], the complete dataset is stored at Tilburg University and will be kept for a minimum of ten years. The PhD supervisor affiliated to Tilburg University, Head of the Department for Information Management of Tilburg University and the researcher have access to the data. After that period the data will be securely removed from Tilburg University's database.

In table 4.8 we present a brief overview of the research design including the case study protocols and research methods.

[3] Regeling Onderzoeksdatamanagement. https://www.tilburguniversity.edu/nl/intranet/informatie-voor/wetenschappers/onderzoek/onderzoeksdata/dtabeleid/download-regeling-onderzoeksdtamanagement/

Table 4.8: Summary of research design.

Step	Activity	Measures
The start of the journey	- Define research objectives and research questions - Selection and analyses of relevant constructs - Formulation of preliminary propositions	- Section 1.3 - Figure 3.1 and 3.2 - Figure 3.2 and section 3.5
Case selection	- Specific target audience - Theoretical, not random sampling	- Stabilisation operations with an integrated and comprehensive design - Aim on interesting cases with accessibility for data collection
Planning and developing of the TFU case study	- Multiple data collection methods - Qualitative data	- Semi-structured interviews - Document analyses - Aim on qualitative reasoning
The field work	- Combination of data collection and analysis	- Conducting interviews - Observations - Reading documents - Interpreting data
Data analyses	- Content analyses. - Relying on theoretical propositions	- Evaluating constructs - Preliminary proposition analysis
Planning and developing the UN MINUSMA case study	- Multiple methods for collecting empirical data - Qualitative data	- Semi-structured interviews - Document analysis - Aim on qualitative reasoning
Field work	- Collection and analysis of empirical data	- Interviews - Observation - Studying documents - Data interpretation
Data analyses	- Content analyses - Relying on theoretical propositions	- Evaluating constructs - Preliminary proposition analysis
Connecting literature	- Comparison with conflicting literature	- Continuously
Almost at the end of the journey	- Theoretical and empirical saturation when possible	- If the findings from the case studies and theory are aligned.

5

Case study 1: Task Force Uruzgan[4]

"The future is uncertain… but this uncertainty is at the very heart of human creativity".

- *Ilya Prigogine (1997)*

5.1 INTRODUCTION

By now we have come to a point where we introduced the initial conceptual model and its derived preliminary propositions. Moreover, we have presented the research design most suitable to this study. Hence, we should shift to the empirical part of this study by presenting the results of the first iteration of the design science process. The aim of this iteration is to deepen our insight of how the uncertainty of the environmental conditions impacts the predictability of stabilisation operations as a complex systems, its subsequent influence on the system's required self-organising ability to differentiate and integrate its sub-systems, organisational resources and competencies, followed by the development of condition-dependent capabilities.

This chapter is organised as follows: we first provide a brief overview of the case study. What follows is the chronological analysis of the conceptual model: in section 5.3 we describe uncertainty and the impact on a system's condition followed by the illustration of a system's required self-organising ability in section 5.4. In section 5.5 we offer an illustration of how systems use information to self-organise the differentiation and integration of their sub-systems, organisational resources and competencies into condition-dependent capabilities. The outcomes gained from condition-dependent capabilities are described in section 5.6. In the final section of this chapter we briefly discuss the main findings of the first iteration.

5.2 CASE STUDY

5.2.1 Historical background

[4] Parts of this chapter have been appeared in the following peer reviewed conference proceedings as:
Gans, B. and Rutkowski, A-F. (2015). Social Consciousness in Post-Conflict Reconstruction. In proceedings of the International Conference on Group Decision and Negotiation, GDN 2015. Outlooks and Insights on Group Decision and Negotiation, LNBIP 218, 31-45.

The great wars of the 20th century were known as symmetrical wars. That is, there is a symmetry between (commonly two) opponents' will and means. According to Smith (2005) in such symmetrical conflicts "both sides had the will and the means to regenerate lost armies and navies, no single battle or campaign could defeat one or the other side" (p. 6). Symmetrical warfare is also known as attrition warfare which is characterised as a military strategy that aims to win a war by continuously wearing down the opponent to the point of physical collapse through losses in personnel and material until the physical will to wage war finally brakes (Van Crefeld, 1986). Contemporary conflicts, including Afghanistan, are known as asymmetrical conflicts. Asymmetrical conflicts are defined by Manwaring (2012) as "population-centric non-traditional warfare waged between a military superior power and one or more inferior powers which encompasses all of the following aspects: evaluating and defeating asymmetric threat, conducting asymmetric operations, understanding cultural asymmetry and evaluating asymmetric cost" (p. 12). In asymmetrical conflicts one actor typically has great means but limited will since the conflict is commonly not in the direct vicinity of the home country and thus not posing an immediate threat. Conversely, the other side has limited means but great will. Moreover, asymmetrical conflicts include many other actors such as IOs, NGOs, local actors (both state and non-state) and the private sector (Smith, 2005). As a result, asymmetries in terms of both means and will occur.

The conflict in Afghanistan illustrates one of asymmetry. Shortly after 9/11 the international coalition exploited their advantage in military capabilities by using US air power which forced the Opposing Military Forces (OMF) to flee from their defensive positions that protected key cities and infrastructure. Unable to compete with the international coalition, however, the OMF exploited their advantage by blending in with the local population and preparing for a long-lasting insurgency directed at the psychological attrition of the coalition's will, specifically, the public consensus supporting the conflict (Farrell et al., 2013). Consequently, the coalition was facing a population-centric conflict.

5.2.2 Case description

In this chapter, we applied the conceptual model to a single case study: the International Security Assistance Force (ISAF). Out of the great number of stabilisation operations conducted at the time of this study, we selected the ISAF mission. We used three selection criteria for selecting this case. First, the ISAF mission was "branded" by NATO and the individual member states as an operation characterised by its high-level of comprehensive design (Baumann, 2009). Indeed, at its height, ISAF consisted of approximately 130,000 personnel, coming from 51 NATO and partner nations (NATO, 2017). Moreover, a great number of IOs (i.e. UNICEF, UN OCHA, UNHCR etc.), NGOs, local actors both state and non-state as well as the private sector were actively operating in Afghanistan. Second, the operation was subject to heavy debate between military and non-military organisations over clarification and delineation of their respective roles and spheres of responsibility (Teuten, 2010). Third and finally, accessibility to sources in order to collect the required data was another important selection criteria. Only when it became clear that we had access to the identified sources the case was selected.

The ISAF mission was established by NATO in 2001 shortly after the 9/11 terrorist attacks. Its mission was to assist the legitimate Afghan authorities with providing security and stability as well as facilitating development cooperation. The mission statement was presented as follows:

> "ISAF, in support of GIRoA [Government of the Islamic Republic of Afghanistan], conducts operations in Afghanistan to reduce the capability and the will of the insurgency, support the growth in capacity and capability of the Afghan National Security Factors (ANSF), and facilitate improvements in governance and socioeconomic development, in order to provide a secure environment for sustainable stability that is observable to the population" (ISAF Mission Statement, 2015).

This case study focuses in particular on the Task Force Uruzgan (TFU) that was part of NATO's ISAF mission in Afghanistan and provides an analysis of the four year (2006 – 2010) mission in Uruzgan province (see appendix A8). The TFU is exemplary for the normative framework (i.e. international efforts to establish an integrated and comprehensive approach between the many military and civilian actors involved), designed by Western governments and IOs to respond to the increasingly complex situations that characterise post-conflict zones such as Afghanistan (Watkin, 2009). We study the TFU as a complex system that is characterised as a whole-of-government-approach in which the Ministry of Defence, Foreign Affairs and Development Cooperation of the Netherlands applied the so-called 3D-concept (i.e. Defence, Diplomacy and Development). A whole-of-government-approach refers to "an approach that integrates the collaborative efforts of the departments and agencies of a government to achieve unity of effort toward a shared goal" (United States Institute of Peace, 2009).

The TFU consisted of approximately 1,400 personnel and included 3 main sub-systems: the TFU Headquarters (TFU HQ), Battle Group (BG) and Provincial Reconstruction Team (PRT). TFU HQ consisted of military staff personnel and accounted for the governance of the operation, particularly since the Netherlands was appointed by NATO as "Lead Nation" and several other NATO-members (i.e. Australia, France and the US) were operating in the province as well. The BG consisted of military combat troops and were responsible for providing security throughout the province, supporting the activities of the PRT and monitoring the Afghan National Security Factors (ANSF). The PRT consisted of advisors from the Ministries of Foreign Affairs and Development Cooperation of the Netherlands as well as a specialised military unit commonly known as Civil–Military Cooperation (CIMIC) that was responsible for the interaction with the civilian actors in the province. The PRT's main responsibilities were to facilitate reconstruction and development activities as well as to promote 'good governance'. Next to these three main sub-systems, the TFU included an Air Task Force (ATF), Special Operations Forces (SOF), Operational Mentoring and Liaison Teams (OMLTs) as well as several support units (i.e. Military Police (MP) and Logistical Support Detachment (LSD)).

Additionally, several other organisations such as UN agencies, NGOs, host nation government, local actors as well as the private sector were active in Uruzgan province. In this study, we view these organisations as complex systems themselves with which the TFU could interact. All these systems together formed a greater

supra-system that focused on the stabilisation and recovery of the province. Referring back to the whole-of-government-approach we argue that when the Dutch government decided on deploying the TFU it automatically became part of a supra-system (e.g. various IOs, NGOs, local actors both state and non-state as well as the private sector) with non-linear dynamics due to an increase of the impact of uncertainty derived from the environmental conditions. Accordingly, the focus of this chapter is twofold: first, we focus on the interaction and information processing between the sub-systems of the TFU (i.e. within a single system). Second, we study the interaction and information processing between the TFU and the other systems within the supra-system. In sum, this chapter performs a general analysis of the multi-actor interaction and information processing that took place in Uruzgan province in the period 2006 - 2010. Figure 5.1 presents an overview of the TFU, its sub-systems and representation within the supra-system.

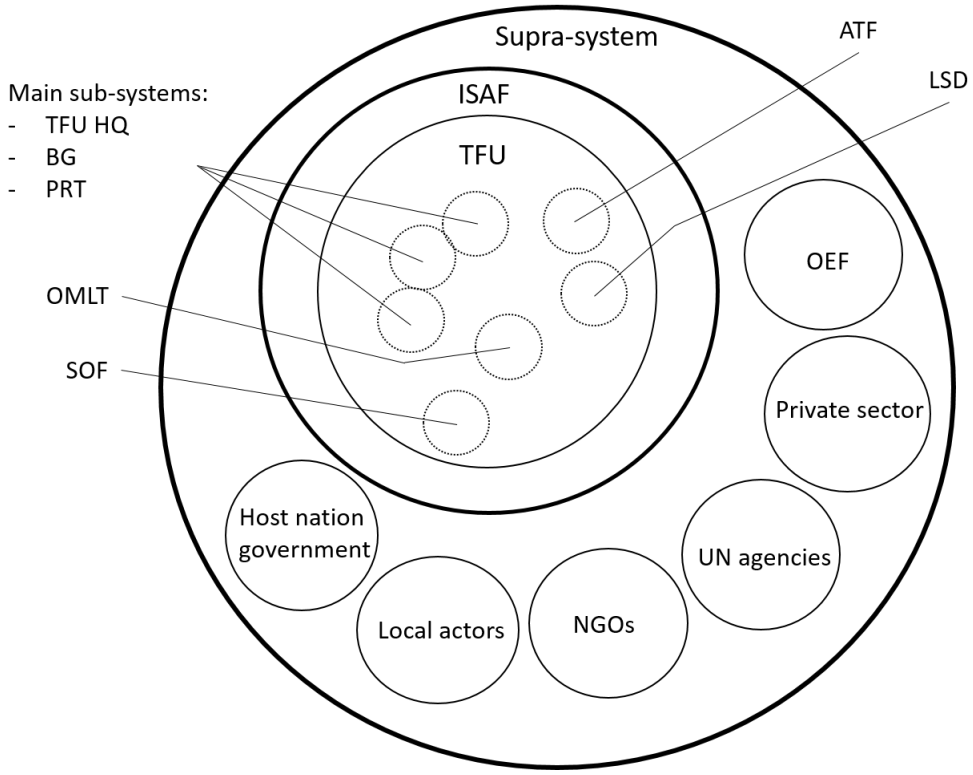


Figure 5.1: The TFU, its sub-systems and representation within the supra-system.

5.3 UNCERTAINTY AND THE IMPACT ON A SYSTEM'S CONDITION

The first iteration of the initial conceptual model enabled us to identify different types of uncertainty which impact the predictability of the TFU's condition, in turn influencing the multi-actor interaction during the mission. We connected these different types of uncertainty to the literature on complex systems thinking and defined them accordingly as impact uncertainty (i.e. sensitive dependence on initial conditions and *equifinality*), modelling uncertainty (imprecise knowledge on how to control input), uncertainty about

relations between actors, environmental uncertainty (i.e. unpredictable events and factors beyond control) and uncertainty about outcomes (see figure 5.2).

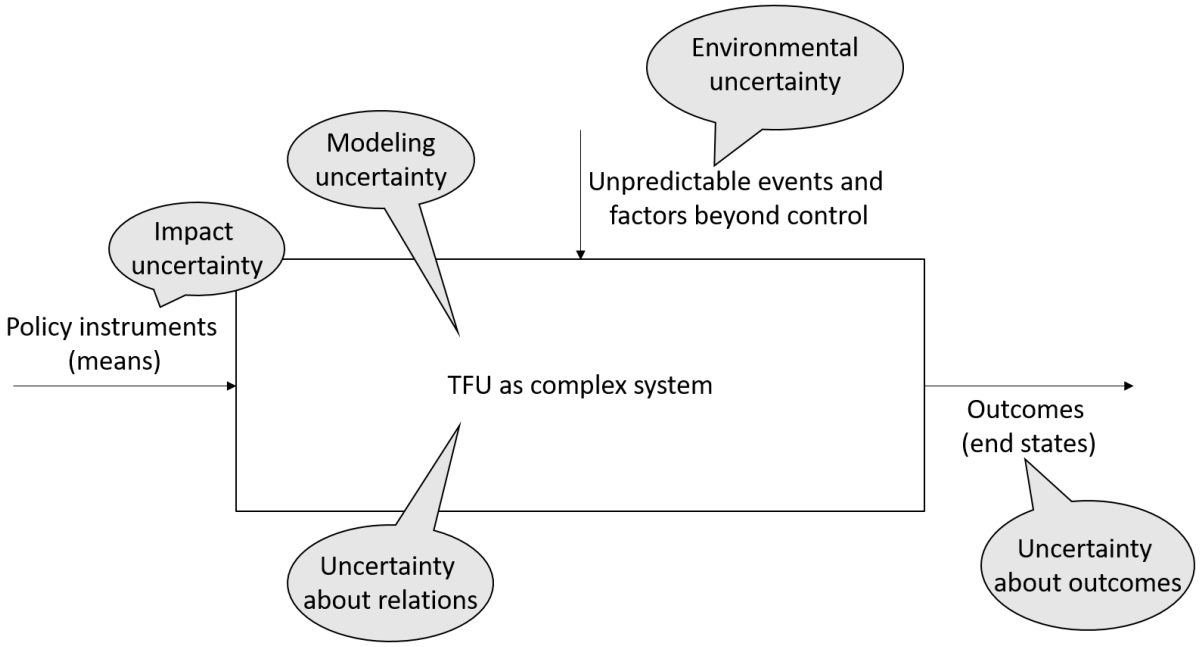


Figure 5.2: Types of uncertainties that impacted the predictability of a TFU's condition.

Impact uncertainty, modelling uncertainty, uncertainty about relations between actors and uncertainty about outcomes were found to be caused by two distinct factors, namely the TFU's strategic model and its system diversity. Environmental uncertainty were found to be caused by the operating environment. Since we found that the factors selected influenced each other in various points in time we describe them interchangeable.

5.3.1 Strategic model

One of the most mentioned factors in the interviews that caused impact uncertainty, modelling uncertainty, uncertainty about relations between actors and uncertainty about outcomes is summarised here as the strategic model applied by the Dutch government to support the Afghan government to establish security and stability as well as facilitating post-conflict reconstruction throughout the country.

Strategy finds its origin in the military where it refers to the achievement of desired political ENDS (i.e. a desired situation in terms of objectives), through the choice of suitable strategic WAYS (i.e. the 'how' in the form of a concept), employing largely the military MEANS (i.e. policy instruments to pursue the desired ENDS). Gray (2015) defines grand strategy as "the direction and use made of any or all of the assets of a security community. (...) In order to be grand, strategy needs to be capable of mobilising any of a community's assets" (p. 86). Grand strategy is considered 'grand' because both its theoretical and practical scope need to be understood in a comprehensive manner. In sum, a grand strategy integrates the purposeful activities of a state together by connecting (political) ENDS to WAYS and MEANS, thereby enabling a whole-of-government-approach. However, the government is only one of the many actors involved in

stabilisation operations. Thus, from the perspective of stabilisation operations a grand strategy ideally integrates the purposeful activities of all the participating actors from the various systems as part of the supra-system (i.e. whole-of-society-approach). We should take note that a whole-of-government-approach or whole-of-society-approach itself must never be mistaken for strategy. By this logic, it would result in simply applying all the purposeful activities of all participating actors from the various systems (the MEANS) to whatever the problem may be. In other words, by mistaken a whole-of-government-approach or whole-of-society-approach for strategy would result in a diagram showing each purposeful activity as a line of effort without determining its feasibility or desirability in relationship to the desired situation (ENDS).

From a business perspective, strategy is defined by Porter (1980) as "the broad formula for how an organisation is going to compete, what its goals should be, and what policies will be needed to carry out those goals" and the "...combination of the ENDS (goals) for which the organisation is striving and the MEANS (policies) by which it is seeking to get there" (p. 24). Typically for stabilisation operations, a strategic model aims to define boundaries on what they should accomplish – or in military jargon – defining a clear 'end-state' (ENDS) (Ramalingam and Mitchell, 2014). Therefore, a strategic model starts by formulating a mission statement which is "a clear and compelling statement that unifies an organisation's effort and describes what the organisation is all about (i.e. its purpose)" (Pearlson and Saunders, 2013, p. 26). Such a mission statement is typically known as the intended strategy (Mintzberg, 1978). To achieve its mission, an organisation should set measurable objectives and performance targets. Then, an organisational strategy and information strategy should be developed to complement the business strategy. An organisational strategy refers to the design, as well as a description how to command, control and coordinate its processes. An information strategy is the plan how an organisation uses Information Systems (IS) to support the business strategy. The alignment between the three distinct types of strategy, the so-called Information Systems Strategy Triangle, is presented in figure 5.3 (Pearlson and Saunders, 2013).

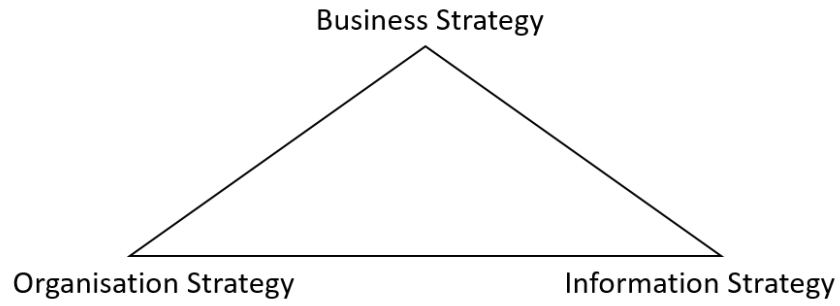


Figure 5.3: The Information Systems Strategy Triangle (Pearlson and Saunders, 2013).

Business strategy (ENDS). The TFU, as part of the greater ISAF-mission, was to support the Afghan government to establish security and stability as well as facilitating development cooperation. The Dutch government further specified this mission statement by presenting a high-level policy white paper drafted

by three Dutch Ministries which stated that the TFU had to focus on safety and security, governance and socio-economic development throughout Uruzgan Province (Ministries of Defence, Foreign Affairs and Development Cooperation of the Netherlands, 2005). Reflecting on both the ISAF mission statement as well as the high-level policy white paper, the TFU had to deal with so-called 'wicked problems' which are "problems that are ill-defined, consist several, conflicting criteria for solution definition, solutions which create further problems and no obvious indications of when enough has been achieved" (Rittel and Weber, 1973, p. 155).

Interestingly, most interviewees found the ISAF mission statement and high-level policy white paper far too abstract. As a result, a "grassroots" strategy was formed by bottom-up planning at the tactical level (i.e. TFU HQ) by developing what was called the 'TFU Master Plan' which functioned as a guideline for the planning and execution of the mission. A commander TFU sums it up:

> "There were no clear goals that came from the political level. Consequently, the TFU HQ wrote a Master Plan that was based on 4 lines of operation (Governance & Justice; Security & Stability; Development; Credible TF). Goals were formulated for 6 months + 2 months overlap due to the rotation rhythm. Every rotation applied this mechanism" (TFU HQ, R4).

By using an Effects-based Approach to Operations (EBO)[5], the 'Master Plan' described the overall effects that were critical to mission success. A detailed overview of the 'TFU Master Plan', its lines of operation and desired effects is presented in figure 5.4. As defined in the Master Plan, TFU's mission was to:

> "Assist the local government in building its capacity, authority and influence and prioritising and synchronising reconstruction and development programmes with assisting the Afghan National Security Factors (ANSF), in order to set the conditions for a secure and stable Uruzgan province" (TFU masterplan, 2006).

Reflecting on the literature on strategy (Mintzberg, 1978; Strachan, 2013), the high-level policy white paper drafted by the three Dutch Ministries illustrates indeed the intersection of the political domain and the employment of instruments of national power as part of the intended strategy. Policy was translated into political ENDS with the important note from the Dutch government that clear and tangible results could not (at least throughout the first period of the mission) be predicted (Netherlands Ministries of Defence, Foreign Affairs and Development Cooperation of the Netherlands, 2005). In other words, the distinction between ENDS as a stochastic process from ENDS as a deterministic process unable to be predicted *ex-ante* perfectly illustrates the TFU's sensitive dependence on initial conditions. Interestingly, and contrary to most contemporary literature on stabilisation operations (Farrell et al., 2013; Grandia, 2015; Kitzen, 2016) and interpretation of most interviewees, we argue that the abstract ISAF mission statement and high-level policy whitepaper fits perfectly with the uncertainty derived from the environmental conditions resulting in dealing with the so-called 'wicked problems', in turn, providing

[5] For an in-depth analysis of an Effects-Based Approach to Operations (EBO) see: Rietjens et al.: Measuring the Immeasurable? The effects-based approach to operations (2011).

ground for an inherent order that identifies and models a system's overall behaviour through adapted and acceptable WAYS. In terms of strategic management this is known as emergent strategy (Mintzberg, 1978).

Business strategy (WAYS). In the white paper, the Dutch government stressed that the TFU's activities would differ from those displayed by the US military since these were too much focused on kinetic counterinsurgency (COIN) operations and were part of the Counter-Terrorism Operation Enduring Freedom (OEF) (Ministries of Defence, Foreign Affairs and Development Cooperation of the Netherlands, 2005). The differentiation in mission focus was underlined by the Dutch government who described the coalition's actions as 'too kinetic': "the international military presence over the past years has been directed at combating the Opposing Military Forces (OMF) instead of improving the living conditions of the population" (Ministry of Foreign Affairs of the Netherlands, 2005). As a result, the TFU would deploy on a population-centric mission which focused on reconstruction and development instead of the predominantly offensive methods employed by US forces as part of OEF and was in accordance with the central focus on stability and a broad perspective on security (Kitzen et al, 2013). This population-centric approach was described by then Chief of Defence Staff General Berlijn (2006) as "an operating style marked by knowledge of and respect for the local culture. It would not close its eyes to operational risks and would provide for sufficiently robust rules of engagement" (Farrell et al., 2013, p. 167). With this speech General Berlijn acknowledged that the stabilisation and recovery operation might entail intense fighting for force protection, a hard lesson of the DUTCHBAT mission in the former Yugoslavia. Again, as described by Korteweg (2011), these kinetic activities were not to be confused with COIN "a term that was expressly avoided also in parliamentary debates, for it had too much of an offensive connotation that would undermine public support" (p. 294).

…the impact of the operating environment. However, as the operation developed over time it became clear that the 'TFU Master Plan' was too ambitious due to the complex operating environment impacting the TFU from outside the system's boundary. To illustrate the complexity of the operating environment we used three criteria, namely the uncertainty derived from the environmental conditions, the situational awareness about the environment, and the feedback received from the environment. Although the Dutch government labelled and presented the TFU politically as a non-kinetic stabilisation and development operation, the security situation was very fragile and the TFU was often engaged in heavy kinetic activities against the OMF. One could argue if the TFU was in fact engaged in a COIN operation (Dimitriu and de Graaf, 2009). As a BG commander puts it:

> "Then we also come to the point that we can discuss whether it was a reconstruction and development or COIN operation? The article-100 letter stated that it was a reconstruction and development operation whilst everyone who came into the Province saw that it was a true COIN operation" (BG, R16).

According to Schaeffer et al. (1988) one needs to comprehend the operating environment with its nature and sources of the conflict. It was the 2007 battle of Chora that turned out to be the moment where clear

and tangible feedback from the operating environment was provided to policy makers and politicians in The Hague and made them comprehend the realities on the ground in Uruzgan. The battle of Chora explicitly implied that the TFU was heavily engaged in kinetic activities and hence the mission gained momentum as a COIN mission instead of the initially proposed population-centric mission which focused on reconstruction and development (Klep, 2011; Ten Cate and van der Vorm, 2012). Consequently, the TFU experienced a lack of progress in improving the security situation throughout the province due to changes in environmental conditions and the low certainty of information about the environment at the start of the mission. Again, a perfect illustration of the TFU's sensitive dependence on its initial conditions and evidence for the argument that the prediction of contemporary conflict is found to be impossible.

Interestingly, although the impact uncertainty and environmental uncertainty imposed a limitation on the predictability of the TFU as complex system, it simultaneously revealed that certain ENDS could be achieved from alternative initial conditions as well as alternative ways (i.e. emergent strategy) as these differences can be amplified through positive feedback controls. This is known as the *equifinality* of open systems (Prigogine, 1985; Gleick, 1987). This characteristic of complex open systems was observed after the mission's mandate in 2008 was extended with two years and a second emergent strategy, known as the Focal Paper, was developed. This new strategy had a narrower geographical focus (i.e. Afghan Development Zone's) as well as a shift of focus in the type of activities (e.g. COIN) the TFU would conduct and was based upon the *tache d'huile* or ink spot concept, a strategy which is known in both colonial warfare as well as the classical COIN era (Kitzen, 2016). In the Focal Paper the new strategy was defined as follows:

> "TFU, as part of the International Security and Assistance Force (ISAF), in cooperation with Afghan National Security Factors (ANSF) and in co-ordination with coalition factors is to conduct counter insurgency (COIN) operations resulting to the expansion of the Afghan Development Zones (Focal Areas) of Tirin Kot, Chora and Deh Rawod in order to neutralise insurgency influence. In order to give the different actors, such as TFU, GoU [Government of Uruzgan] and NGOs/IOs [International Organisations], clarity on the effects and milestones to accomplish, the Focal Paper translates the three Endstates [safe and secure environment; socioeconomic development, governance] into seven detailed Lines of Effects (LoE): (1) security apparatus, (2) secure areas, (3) infrastructure, (4) basic living conditions, (5) health & education, (6) economic diversity and (7) governance support & capacity" (TFU HQ, 2008).

Figure 5.4: TFU Master Plan. Source: adopted from TFU HQ (2007).

Finally, and after it became clear that another extension of the mandate was highly unlikely due to heavy National political discussion, TFU HQ designed a third emergent strategy, the Uruzgan Campaign Plan (UCP), which was presented mid-2009 and basically described the transfer of the TFU's authorities to the Afghan authorities and a potential ISAF successor. According to the UCP:

> "The TFU is to provide a common ground for TFU and its Afghan and international partners within the province. In other words, the UCP is to facilitate, cooperation and to create unity of effort, which becomes even more important in a multinational context and with the increase of Afghan capacity and involvement in the mission. The TFU campaign objective, within the context of the UCP, as part of ISAF, in partnership with ANSF and in coordination with GIRoA [Government of the Islamic Republic of Afghanistan], United Nations Assistance Mission Afghanistan (UNAMA) and the International Community, is to contribute to a reliable and effective government that can bring the government and the people closer together, and is able to provide a stable and secure environment and development progress in Uruzgan, in due course without ISAF support" (TFU HQ, 2008).

Like the Focal Paper, the UCP focused on three end-states, namely governance, development and security. Each were divided in reconstruction and development themes and were organised in an intellectual framework. Interestingly, this framework included several identified disablers and enablers that potentially hampered and enhanced goal attainment respectively. An overview of the UCP is illustrated in figure 5.5.

As presented above, the end-states and desired effects were described in the Focal Paper and the UCP. However, the data indicates that the interviewees perceived to deal with abstract goals that were hardly measurable. Similar results were found by Rietjens et al. (2013) who indicated that "ambiguity led to a lack of common understanding of the goals and tasks of CIMIC among different contributing nations, rotations and military command levels within ISAF" (p. 345). The Dutch government stressed the abstraction-level of the ENDS in their high-level policy white paper due to the uncertainty of the environmental circumstances in Uruzgan province (Ministries of Defence, Foreign Affairs and Development Cooperation of the Netherlands, 2005).

Indeed, organisations that must deal with 'wicked problems' hold important management implications (Tompkins, 2005) such as dealing with ambiguous, intangible and changing goals, are experiencing difficulty with establishing performance standards and measuring results (Wilson, 1989). This applies in particular to stabilisation operations where outputs often are unobservable and unmeasurable (Dobbins et al., 2005; Zapach, 2014). Consequently, strategic management tools are only applicable to a very limited extend (Davids, 2011; Muggah and Sang, 2013).

Additionally, the data illustrates a change in strategic thinking driven by the adaptation of goals during the four year deployment of TFU. Kitzen et al. (2013) summarises these changes in strategy as follows: "while the Master Plan was designed to foster security and development in the entire province within two years, the Focal Paper provided a much needed adaptation to the harsh reality of campaigning in Uruzgan. The Focal Paper not only acknowledged that the military was not merely providing security and development

assistance, but actually involved in COIN, and also set some more realistic targets by focusing TFU efforts for the additional two years of the mission to the three main ADZs. Finally the UCP was formulated to arrange a smooth transfer of authority from the Dutch TFU to the local government and the ISAF successors" (p. 172).

It was the Prussian general Von Clausewitz (1932) who studied strategy by looking at the nature of the whole. He argued that once war begun the opponents would start battling each other, and more importantly, so would their policies. Hence, this reciprocity creates its own dynamic which can have consequences that are different from the policies that were meant to be guiding it (Strachan, 2006). In other words, the strategic model of war, including the business, organisation and information strategy, are subject to change.

Indeed, it was the sensitivity to the initial conditions that provided ground for an inherent order that identified and modelled the system's overall behaviour through adapted and acceptable WAYS. The *equifinality* of open systems enabled the early on bottom-up emergence of strategy at the tactical level (i.e. TFU HQ) during the process of self-organisation. However, this emergent strategy was never truly recognised as the official strategy for the TFU, nor did the political level held ownership over it (Grandia, 2015). Furthermore, initial strategic thinking of the TFU was dominated by the Dutch political climate and its fear for public opinion Farrell et al., 2013). Consequently, the Dutch government engendered difficulties in trying to communicate the purpose of the TFU to the Dutch population since the strategic narrative of the mission was not apprehended by the Dutch population (Farrell et al., 2013; Kitzen, 2013). Finally, the realities and complexity of the operating environment heavily impacted the TFU, eventually resulting in a distinct deviation from the initial political guidelines.

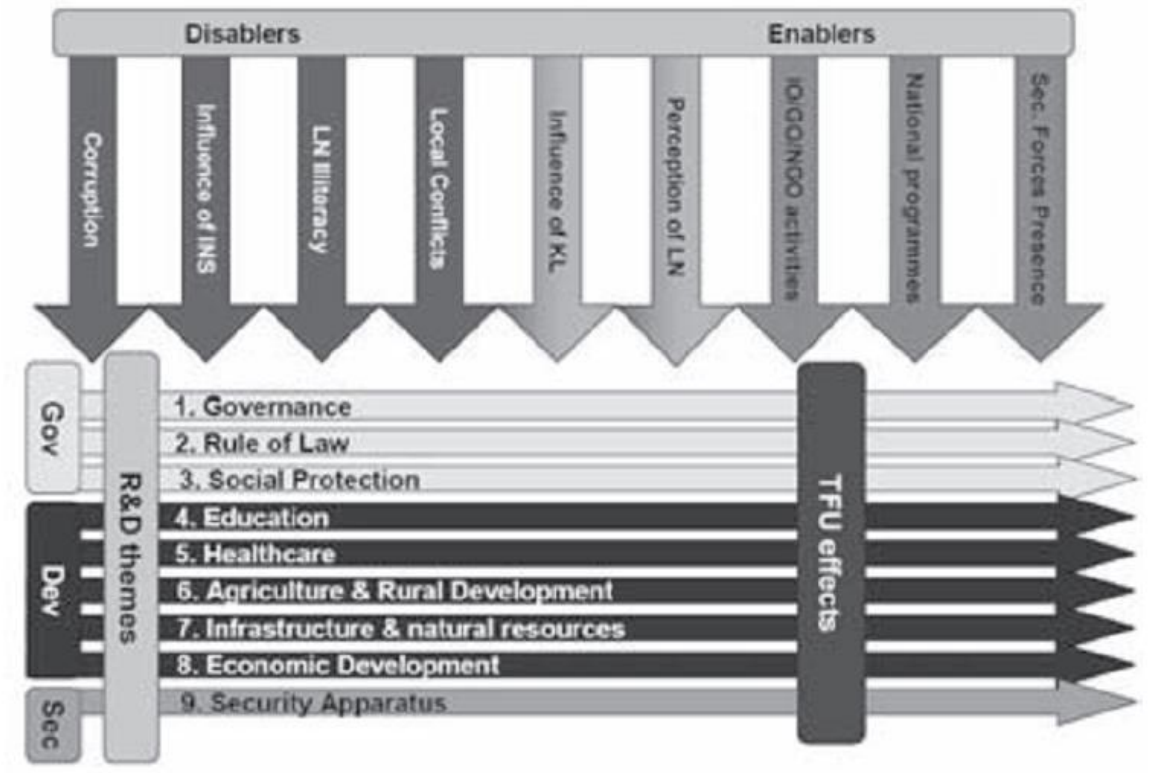


Figure 5.5: The Uruzgan Campaign Plan. Source: adopted from TFU HQ (2009).

Time also played an important role in the way most interviewees perceived the mission's strategic model. The initial two-year mandate was perceived by a Civilian Representative (CivRep) as a real limitation for credible goal-setting, especially in relation to the level of progress that had been made.

> "Reconstruction efforts are generally a long-term activity. The uncertainty about the TFU's mandate made it really hard to plan for long-term development and allocate the necessary resources" (TFU HQ, R8).

A commander TFU stated that during his deployment he did not know whether the mission's 2-year mandate was going to be extended and, consequently, what his course of action would be:

> "The question was if we still had to plan for long-term reconstruction or we had to shift to a possible re-deployment back to the Netherlands. Two important questions were 'when did the Netherlands want to hand over to the Afghan government and which of the NATO partners will be taking over our tasks?' I could not get an answer at that time from the Netherlands". (TFU HQ, R7).

The importance of the combination of having clear formulated goals and determining a desired end-state is mentioned by many scholars (Lahneman, 2004; De Wijk, 2005; Fraticelli, 2005). However, this is contradictory to what we previously identified, namely that stabilisation operations often have to deal with 'wicked problems'. Therefore, we suggest that an end state should be defined in terms of achieving certain conditions instead of time. One could compare this with criminality in Western societies: we basically accept that it is part of our societies and have the rule of law to consolidate certain 'acceptable' conditions. Again, this requires the need for long term commitment. Scholars argue that staying committed until certain

conditions are achieved is the *sine qua non* for a successful stabilisation operation (Schmidl, 2004; Cavaleri, 2005; Smith, 2005). From this perspective, 'time' can be viewed as a key resource for stabilisation operations.

Several interviewees also indicated that there were no efforts from their side (i.e. the TFU) to synchronise their strategy with that of the other systems as part the supra-system. This was perceived as a major shortcoming since an integrated approach requires more than the participation of various government agencies, as a diplomat emphasised:

> "We need to partner up. The true grasp of what is happening on the ground cannot be left to Defence, Diplomacy, or Development alone. A true comprehensive approach requires the participation of NGOs and private firms. Those stakeholders need to be involved in order to be successful on the long-term. In order to successfully attract NGOs and private firms for an integrated approach they need to be engaged at the initial decision-making process. Collaborative goals need to be developed so those NGOs and private firms can conduct their own long-term planning and allocation of resources. Talking about the analyses, what is the problem, what are we going to do about it? There you have the possibility to really include the options for the NGOs and the private sector to take their role". (TFU HQ, R2).

Organisational strategy (MEANS). The TFU was tasked with a population-centric mission which focused on reconstruction and development activities. This mission type was relatively new for the Dutch since military doctrine was originally focused on enemy-centric missions. Only during the missions in the former-Yugoslavia and Iraq, the Dutch had gained some experience in population-centric operations. Therefore, the TFU and its sub-systems, initially had to deal with an unfamiliarity in regards to their roles, tasks and organisation. Hence, for the first months of the mission the TFU's sub-systems pioneered their own approach. Once the TFU was more familiarised with its mission, the organisational strategy was designed on a clear division of labour with hierarchical institutionalised structures. Whereas the TFU HQ accounted for the governance of the operation, the PRT's main responsibilities were to facilitate reconstruction and development activities as well as to promote 'good governance'. The BG was to provide security assistance with the aim to establish a permissive environment which allowed for the above activities to take place (Ministries of Defence, Foreign Affairs and Development Cooperation of the Netherlands, 2005).

In order to achieve its mission the TFU HQ drafted a first concept of operations which contained the deployment of its forces (e.g. PRT and BG) to the densely populated areas of Tirin Kot and Deh Rawod. These two areas were designated as the starting point from where the TFU intended to improve in security and governance in order to enhance the relationships between the local population, the Afghan government and the TFU (Rietjens, 2013; Kitzen et al., 2013). Additionally, these two areas would function as a steppingstone for gaining control over the rest of Uruzgan province. However, von Clausewitz (1832), reminds us: "war is the realm of uncertainty; three quarters of the factors on which action in war is based are wrapped in a fog of greater or lesser uncertainty" (p. 101). From a complexity and systems theory perspective: the TFU was inherently sensitive to its initial conditions. This clearly applied to the TFU since shortly after the start of the mission it was ordered to support their higher headquarters for one month

(Regional Command South (RC-S) with one of the BG's three infantry companies. Moreover, the Chora district was also to be designated as one of the densely populated areas and to which the TFU had to deploy part of its forces. According to several participants, this unexpected expansion of footprint resulted in the overstretching of resources from the start of the mission.

The overall management of the TFU included centralised planning and decision-making, while execution was decentralised. In the literature this is known as the degree of requisite integration (March and Simon, 1958). Lawrence and Lorsch (1986) describe requisite integration as "task characteristics which make it possible for sub-systems in an organisation to operate independently of each other, or require continual collaboration in making decisions before a given sub-system may act. The greater the degree of requisite integration between two sub-systems the more difficult it will be to achieve integration" (p. 10). In practice there was room for TFU personnel to engage in a form of mixed governance with space left to negotiate under the supportive shadow of hierarchy. From 2006 until 2009 the decisions were taken by the military commander of the TFU (C-TFU). The Political Advisor (PolAd) of the Ministry of Foreign Affairs functioned as a personal advisor to the C-TFU. Over time this part of the mission's organisational strategy was identified as inefficient. Consequently, as of 2009 TFU HQ made a unique adjustment to its organisational strategy by handing over the command of the PRT from a military commander to a career diplomat. Moreover, with this change in command the mission came under dual-headed leadership. The joint decision-making process was perceived as effective since they could easily consult each other. They converge in planning the actions core to the mission and agreed on allocating the scarce resources. A CivRep sums it up:

> "Since 2009 the TFU was set up in an integrated way. Two people were put at the head of the TFU; Defence and Diplomacy. The two had very different responsibilities, dual-lead in all decisions were taken by both. They together always discussed from both perspectives, the elements, i.e., situational context and resources, compared those and used an integrated approach to take the decision". (TFU HQ, R10).

Another important element of the TFU's organisational strategy was that of counter-organisation of local forces (Ministries of Defence, Foreign Affairs and Development Cooperation of the Netherlands, 2005). In the TFU's case this implied the organisation of local forces that would keep a permanent presence throughout the province (i.e. not limited to the densely populated areas of Tirin Kot, Deh Rawud and Chora) by manning small bases. The Dutch preferred to partner with the Afghan National Police (ANP) or Afghan National Army (ANA). Unfortunately, this was infeasible since these forces were only available in a very limited number. A possible alternative brought up by the TFU HQ, namely to partner with local militias was rejected due to political caveats (i.e. restrictions) imposed by the Dutch government. Ultimately, a creative solution was found that matched both the realities on the ground as well as that of the political level. The TFU would partner with the Afghan National Auxiliary Police (ANAP), a tribal militia that was formalised as a sub-unit of the Afghan National Security Forces (ANSF).

Information strategy. The TFU had difficulty to link its information strategy with its organisational strategy and business strategy. In our analyses, we distinguish between internal centralised information sharing (i.e. within the individual sub-systems of the TFU), internal distributed information sharing (i.e. between the sub-systems of the TFU) and external distributed information sharing (i.e. between the sub-systems of the TFU and the other systems involved).

First, internal centralised information sharing was considered by all interviewees as sufficiently institutionalised. Daily reporting through fixed reporting lines were present in all sub-systems. Most of these reports were sent to the TFU HQ and then merged into a centralised report.

Second, internal distributed information sharing was hindered by the absence of a general information system or database with access for all the sub-systems. The TFU used three different encrypted information and communication systems that came originally from the Dutch military, each of which designed for a specific level of classification. So, within the TFU an information system is tailored to the classification. Based on the classifications there are in general three communication systems. Table 5.1 presents an overview of these systems. The exact names of the systems are replaced by fictive names due to the sensitive nature of those systems.

Table 5.1: Information processing of the TFU.

Actors	Means	Organisational design strategy
TFU (internal)	Encrypted ICTs Face to face	Slack resources Investment in vertical information systems
TFU > ISAF HQ	Encrypted ICTs	Slack resources Investment in vertical information systems
TFU > Dutch government	Encrypted ICTs	Slack resources Investment in vertical information systems
TFU > IOs (i.e. UN agencies	General ICTs (non-encrypted) Face to face (coordination meeting)	Creation of lateral relationships
TFU > NGOs	General ICTs (non-encrypted) Face to face (coordination meeting)	Creation of lateral relationships
TFU > local actors (state and non-state)	General ICTs (non-encrypted) Face to face	Creation of lateral relationships
TFU > private sector	General ICTs (non-encrypted) Face to face	Creation of lateral relationships
TFU > OEF	Face to face	Creation of lateral relationships

The main shortcoming of these information systems from the context of an integrated and comprehensive approach is that they are based upon NATO standards with standardised classifications of 'NATO SECRET'. This negatively influenced the external sharing of military information since military members of the TFU were unable to share most military information with their civilian members of the TFU HQ and PRT (e.g. employees of the Ministry of Foreign Affairs and Development Cooperation) who did not have

these systems at their disposal which hampered internal distributed information sharing (i.e. within the TFU itself). A CivRep explains:

> "There was this very awkward situation where […] and I sat in the same office but were not able to share each other's information since our systems were not compatible". (TFU HQ, R9).

Fortunately, difficulties were mostly overcome since they could get access to the systems through their military counterpart.

Third, external distributed information sharing between the TFU and the other actors involved was done by telephone, email or in a face to face manner (see table 5.1). However, sharing classified information through these communication systems was not permitted. Rietjens et al. (2013) found similar constraints in the sharing of information between CIMIC units in ISAF and external actors: "to be able to share CIMIC information products with external actors, they usually had to be declassified. However, most other information sources of ISAF remained classified and it was frequently unclear to what extent these were allowed to be shared with external actors" (p. 347).

Stabilisation operations typically encounter difficulty with the proper functioning of technological channels such as telephone and e-mail (Rietjens et al., 2013). Our data supports these findings since both the quality as well as the quantity of external information processing was hindered by the lack of an integrated information and communication system. Consequently, the supra-system had to deal with an information asymmetry. Fortunately, the TFU HQ as well as the commander PRT organised daily and weekly meetings and briefings in which actors from the other systems could participate in order to communicate with each other, share information and identify opportunities for integration. In other words, the TFU HQ invested in increasing the information processing capacity through the creation of lateral relations. An information manager sums it up:

> "Regarding information sharing outside the task force…it always must be unclassified information, you cannot do anything else than work on non-classified networks. As we are accustomed at the MoD to work with classified information, they [NGOs] are not. So, you must declassify the information first or make sure that is already unclassified. And if it is classified information, then you should not share it in a network but possibly face to face, depending on the urgency". (TFU HQ, R12).

The absence of a joint ICT system was perceived by all interviewees as a huge shortcoming. Moreover, several respondents mentioned that the development of such a system is one of high importance. As a commander TFU stated:

> "There was no joint information system. Therefore, we had weekly meetings where all stakeholders participated in. However, there is a need for an integrated information management system. This needs to be developed. There are some obstacles on both the governmental site and the NGOs / IOs that need to be taken". (TFU HQ, R4).

The final issue that hampered external distributed information sharing is related to cultural differences. In the literature, cultural differences are typically described as an important reason for hampering the sharing of information between civilian and military organisations during stabilisation operations (Duffey, 2000; Scheltinga et al., 2005; Rietjens, et al., 2013; Holmes-Eber, 2016). This final issue will be discussed in more detail in the next section (i.e. system diversity).

In sum, the strategic model of the TFU perfectly fits with the complex systems modelling tools derived from complexity theory. Policy was translated into political ENDS with the important note from the Dutch government that clear and tangible results could not (at least throughout the first period of the mission) be predicted (Ministries of Defence, Foreign Affairs and Development Cooperation of the Netherlands, 2005). Hence, the distinction between ENDS as a stochastic process from ENDS as a deterministic process unable to be predicted *ex-ante* perfectly illustrates the TFU's sensitive dependence on its initial condition. Interestingly, these findings are contrary to most contemporary literature on stabilisation operations (Farrell et al., 2013; Grandia, 2015; Kitzen, 2016) as well as the interpretation of most interviewees, we argue that the abstract ISAF mission statement and high-level policy whitepaper fits perfectly with the complexity, dynamic and uncertainty of the environmental conditions resulting in the so-called 'wicked problems', in turn, providing ground for an inherent order that identifies and models a system's overall behaviour through adapted and acceptable WAYS.

Interestingly, although the impact uncertainty and environmental uncertainty imposed a limitation on the predictability of the TFU as complex system, it simultaneously revealed that certain ENDS may be the result of WAYS that started from different initial conditions as these differences could be amplified through positive feedback controls. This characteristic of complex open systems was observed after the mission's mandate in 2008 was extended with two years and a second "grassroots" strategy, known as the Focal Paper, was developed.

Finally, several issues negatively influenced the information strategy. Fortunately, in most situations the TFU turned out to display adaptive behaviour by adjusting its working processes, hierarchical structures and ways of communicating in order to successfully respond to the changing environmental conditions. Hence, most difficulties were overcome by adaptive complex adaptive behaviour at the tactical level (i.e. TFU HQ) during the process of self-organisation. Unfortunately, this emergent bottom up planning was never truly recognised as the official strategy for the TFU, nor did the political level held ownership over it (Grandia, 2015). However, the definition of ENDS and allocate the appropriate MEANS is the responsibility of the political level (Clark, 2001; Grandia, 2015). Smith (2005) also reminds us of the importance of a clear strategy: "it must always be remembered that the political objective and the military strategic objective are not the same, and never are the same: the military strategic objective is achieved by military force whilst the political objective is achieved as a result of the military success" (p. 12). Thus, to cope more effectively with the uncertainty that characterises stabilisation operations, strategic modelling should be conducted by both

policy makers as well as practitioners and needs a constant reassessment to maintain the right balance between political level and those who are in the field.

Representations of the Cynefin framework. Reflecting on the Cynefin framework we suggest that the business strategy of the TFU was balancing between the "chaotic" situation of the unordered domain and "complicated" situation of the ordered domain. On the one hand, as the business strategy and derived goals were developed by the Dutch government (i.e. high-level white paper) we suggest that from their perspective the business strategy was found in the "complicated" situation of the ordered domain with the characteristic of cause and effect relationships that required some deeper analyses. This view is supported by the high-level white paper in they issued the important note that clear and tangible results could not (at least throughout the first period of the mission) be predicted (Ministries of Defence, Foreign Affairs, Defence Development Cooperation of the Netherlands, 2005). On the other hand, most interviewees found the ISAF mission statement and high-level policy white paper far too abstract. As a result, a "grassroots" strategy was formed by bottom-up planning at the tactical level (i.e. TFU HQ) by developing a what was called 'initial strategy' defined as the 'TFU Master Plan' which functioned as a guideline for the planning and execution of the mission. The distinction between ENDS as a stochastic process from ENDS as a deterministic process unable to be predicted *ex-ante* perfectly illustrates the TFU's sensitive dependence on its initial conditions. Therefore, we argue that the abstract ISAF mission statement and high-level policy whitepaper fits perfectly with the uncertainty derived from the environmental conditions, in turn, providing ground for an inherent order that identifies and models a system's overall behaviour through adapted and acceptable WAYS. However, since this view on the TFU's strategic model was not supported by that of the participants we suggest that for them the business strategy was found in the "complex" situation of the unordered domain.

The TFU was characterised by a heterogeneous system consisting of multiple sub-systems and part of a bigger supra-system including IOs, NGOs, local actors and the private sector. As a result, the TFU was able to implement most of its organisational strategy, however, cause and effect relationships of the connections required some deeper analyses. This is best illustrated by the fact that the TFU, shortly after the start of the mission, was ordered to support their higher headquarters for one month (Regional Command South (RC-S) with one of the BG's three infantry companies. Moreover, the Chora district was also to be designated as one of the densely populated areas and to which the TFU had to deploy part of its forces. This unexpected expansion of footprint resulted in the overstretching of resources from the start of the mission.

Moreover, the overall management of the TFU included centralised planning and decision-making, while execution was decentralised. From 2006 until 2009 the decisions were taken by the military commander of the TFU (C-TFU). The Political Advisor (PolAd) of the Ministry of Foreign Affairs functioned as a personal advisor to the C-TFU. Over time this part of the mission's organisational strategy was identified as inefficient. Consequently, as of 2009 TFU HQ made a unique adjustment to its organisational strategy by handing over the command of the PRT from a military commander to a career diplomat. Moreover, with

this change in command the mission came under dual-headed leadership. The joint decision-making process was perceived as effective since they could easily consult each other.

Another important element of the TFU's organisational strategy was that of counter-organisation of local forces (Ministries of Defence, Foreign Affairs Development Cooperation of the Netherlands, 2005). In the TFU's case this implied the organisation of local forces that would keep a permanent presence throughout the province (i.e. not limited to the densely populated areas of Tirin Kot, Deh Rawud and Chora) by manning small bases. The Dutch preferred to partner with the Afghan National Police (ANP) or Afghan National Army (ANA). Unfortunately, this was infeasible since these forces were only available in a very limited number. A possible alternative brought up by the TFU HQ, namely to partner with local militias was rejected due to political caveats (i.e. restrictions) imposed by the Dutch government. Ultimately, a creative solution was found that matched both the realities on the ground as well as that of the political level. The TFU would partner with the Afghan National Auxiliary Police (ANAP), a tribal militia that was formalised as a sub-unit of the Afghan National Security Forces (ANSF). Hence, we suggest the organisational strategy of the TFU was balancing between the "complicated" situation of the ordered domain and the "chaotic" situation of the unordered domain.

The TFU's information strategy suggests a comparable situation. While the TFU was sharing information with each other through encrypted ICT assets, most other actors (e.g. IOs; NGOs; local actors both state and non-state as well as the private sector) did not receive this information. Conversely, the information collected by the latter could only be communicated to the former through unsecure general ICT assets or wasn't shared at all, thereby making cause and effect relationships unclear. Consequently, both the quality and quantity of information sharing is very poor, ultimately resulting in an information asymmetry. Fortunately, the investments that were made in increasing the information processing capacity through the face to face meetings such as the coordination and security meeting proved to be an effective mechanism for countering the poor presence of interoperable ICTs. Accordingly, we suggest that the TFU's information strategy was balancing between the "complex" and "chaotic" situation of the unordered domain.

5.3.2 System diversity

Uncertainty about relations between actors and uncertainty on how to control INPUT is found to be caused by system diversity. Indeed, in the context of stabilisation operations, actors often have to cope with extreme cultural differences causing daily friction (Wislow, 2002; Bollen, 2002; Abiew, 2006; Holmes-Eber, 2016), and behave strategically in order to maximise their own interests (Williams, 2011). We found that most interviewees often experienced tension between the various sub-systems and systems, in turn, impacting to the complexities and uncertainties of their interaction. Furthermore, organisations that have to deal with ambiguous, intangible and changing goals are experiencing difficulty with establishing performance standards and measuring results (Wilson, 1989). This also applies to stabilisation operations where outputs often are unobservable and unmeasurable (Dobbins et al., 2005; Zapach, 2014). Consequently, strategic management tools are only applicable to a very limited extend (Davids, 2011; Muggah and Sang, 2013).

The TFU's mission required interaction with several other systems (i.e. other coalition factors, IOs, NGOs, host nation government and private firms) as part of the supra-system. According to the linear way of thinking of an integrated approach, effective collaboration is a key element to success because actions are expected to be interdependent (De Coning and Friis, 2011; Zelizer et al., 2013; Lucius and Rietjens, 2016). According to the literature, such cross-functional work groups, in regards to the capabilities they provide, may outperform individuals in terms of quality decision-making (Ilgen, 1999; Argote et al., 2000). These differences of providing information and expertise to the group is known as informational diversity (Homan et al., 2007). Informational diversity often comes together with other diversity types such as surface-level or demographic (age, gender, ethnicity) and deep-level (differences in personal values and organisational culture) diversity (Jackson et al., 1992; Triandis et al., 1993; Williams and O'Reilly, 1998; van Knippenberg and Schippers, 2006). Social identity theory explains that humans view themselves in the context of group memberships (Tajfel, 1978). Researchers found evidence suggesting that both surface- and deep-level diversity influence individual group members' experiences as well group outcomes (Jackson et al., 1992; Milliken & Martins, 1996; Harrison et al., 1998). In particular, surface-level diversity is found to be related to inter-relationship conflict (Pelled, 1996; Thatcher et al., 2003). However, we know little about the way individual characteristics relate (under what conditions) to group dynamics (Tsui et al., 1992; Williams & O'Reilly, 1998).

Converting these different diversity types can enable the emergence of so-called diversity fault lines that may strengthen sub-group categorisation (i.e. "us and them") (Lau and Murnighan, 1998; van Knippenberg et al., 2004). As result of sub-group categorisation, group members can be less willing or trusting to interact with each other and hence display less commitment to the group as well as reducing their communication (Earley and Mosakowski, 2000; Li and Hambrick, 2005). Thus, diversity may positively influence the performance of cross-functional work groups through information processing. Conversely, it may disrupt cross-functional group performance due to inter-relationship conflict and when combined with elements from surface- and deep-level diversity enable sub-group categorisation.

Diversity was found to be an important factor that impacted the predictability of the TFU as complex system. We differentiate between surface-level and deep-level diversity. Two mainstream types of diversity which we be discussed below.

Surface-level diversity. Surface-level or demographic diversity is an umbrella term which indicates group heterogeneity formed through elements such as gender, age, ethnic background and profession (Tsui et al., 1995; Lawrence, 1997). While people can easily categorise themselves in various ways, denying demographic attributes is more difficult (Mohammed and Angell, 2004). Empirical evidence indicates that the creation of an initial perception of each other highly depends on surface-level characteristics (McCann et al., 1998).

According to Pelled (1996) the visibility-level of a specific characteristic and the impact on inter-group conflict are causally related. Previous studies found that that heterogeneity on gender and ethnicity increase inter-group conflict (Thatcher et al., 2003). Within stabilisation operations, therefore, actor's demographic

characteristics may influence one's attitude toward other actors. Moreover, it could serve as a potential source of the formation of sub-groups within a particular sub-system. The TFU is characterised by its multidisciplinary organisation and intentions to meet cooperation and coordination among other actors involved.

Deep-level diversity. Research on group dynamics is mostly concerned with the impact of surface-level diversity (Tsui et al., 1995; Milliken and Martins, 1996; Williams and O'Reilly, 1998). Some studies, however, have assessed the influence of less observable aspects such as norms, values, beliefs and culture (Jackson et al., 1992; Jehn et al., 1999). Due to their less observable character, these differences are considered deep-level diversity (Harrison et al., 1998).

Deep-level diversity is often described in literature as an important cause of problems in civil–military cooperation (Manning, 2003; Rathmell, 2005; Paris, 2009). Moreover, divide in culture does not only affect civil-military cooperation but causes difficulties between the international- and the local actors as well (Bollen, 2002; Abiew, 2006; Autesserre, 2014; Holmes-Elber, 2016). Such differences in culture could potentially escalate into hostile and violent behaviour from one actor to another (Bordin, 2011).

Friction was observed between several distinct systems, namely the TFU, the local population, local Afghan government and NGOs. More interestingly, friction was found between the sub-systems of the TFU itself (i.e. the TFU and BG). This friction was due to differences in organisational culture between the actors involved. Schein (1988) defines an organisational culture as "1) a pattern of basic assumptions, 2) invented, discovered, or developed by a given group. 3) as it learns to cope with its problems of external adaptation and internal integration, 4) that has worked well enough to be considered valid and, therefore 5) is to be taught to new members as the 6) correct way to perceive, think, and feel in relation to those problems" (p. 7). The purpose of an organisational culture is to refer to the organisation's core values and beliefs that an organisation develops to pursue its mission. We found that the TFU had to cope with differences in organisational culture (e.g. interpersonal orientation; time orientation; goal orientation) between its sub-systems and between the TFU and other complex systems causing daily friction. As a commander TFU puts it:

> "The various Ministries as well as these Ministries and NGOs were not often on the same page. It was not really easy to have them all on the same sheet of paper. In the best case, we could prevent conflict of interest. This is not always easy to operationalise because we come from different organisations, have different working cultures and strongly differ in perspective". (TFU HQ, R1).

According to Baumann (2009), an organisational culture, however, "not only informs the nature of templates, routines and standard practices that a given organisation develops in the pursuit of its mission; it is also reflected in the choice of resources and capabilities deemed worth acquiring or maintaining by the organisation" (p.72). Thus, organisational culture is used by organisations to identify problems and mechanisms to solve them, as well as to define their interests and prioritise them. Finally, organisational culture is used to define an organisation's environment in terms of value and meaning. Despite differences

in organisational culture, actors involved in stabilisation operations need to understand the importance of establishing some level of inter-relationships since they could need each other's support (Ashdown, 2003). A commander PRT perfectly describes this inevitable paradox:

> "There was always tension, it never became smooth. It is not bad because if we have development and military going hand in hand in an operation and there is no struggle something is wrong. Our ultimate goals are maybe the same, but the ways we achieve them are fundamentally different. In the military, it is about employing the force, we are willing employing the force in order to "subjugate" our opponent, the development people try to get the people engage in their economy, so they do not fight anymore, so that is a different mechanic. We need each other. You cannot create stability without security, you cannot create security without stability so it goes hand in hand". (PRT, R20).

The U.S. military units deployed into Uruzgan province under the mandate of Operation Enduring Freedom (OEF). The C-TFU had received orders from his leadership in the Netherlands not to collaborate, but to "only support in extremis". Thus, interaction was hampered by political constraints. There was neither a functional relationship nor institutionalised structure between them. In practice this meant that both the C-TFU and the leadership of the OEF units in the Province informed each other about their intentions with the purpose of deconfliction. An exception were the activities from the US Special Operation Factors (US SOF) of which the C-TFU was not informed due to sensitivity of their activities.

> "Only remark were the operations conducted by US SOF in the area. We simply didn't know what they did and what possible effects they created in the province". (TFU HQ, R4).

This lack of deconfliction with the C-TFU, who was appointed "battlespace owner", potentially settled the system in unordered conditions since the US SOF operations could create contradictory effects to those of the TFU. A C-PRT explains:

> "We were developing projects related to education, infrastructure and healthcare for example. We invested in strengthening the relationships with the local population. Then at night a raid has been conducted by the US SOF units. Obviously, without anyone knowing about this. This creates friction in the relationships between us. More importantly, it jeopardised our relationships with the locals since they all see us as Western factors". (PRT, R22).

Communication and collaboration with IOs and NGOs took place through the PRT. There was no functional relationship between the C-PRT and the IOs and NGOs. The institutionalised structure was non-hierarchical (i.e. mutual influence) and agreements were achieved through bargaining or arguing. However, only a very limited number of UN agencies were present in Uruzgan Province. It took until 2009 that the United Nations Assistance Mission in Afghanistan (UNAMA) started operating in the Province. This applied for the NGOs as well, since there were only six international NGOs present at the start of the TFU in 2006. However, over time their presents was greatly enhanced with almost fifty by the end of 2010. Several NGOs were very reluctant to be associated with the TFU due to fundamental principles (i.e. humanitarian principles, independence and neutrality). Conversely, it is military personnel who typically are

frustrated to work with partner organisations such as NGOs "whose social and organisational structures are much more fluid, egalitarian and (from a military perspective) ill-defined (Holmes-Eber, 2016, p.196). Other NGOs acted more pragmatic and stood open for some form of interaction due to instrumental motives (e.g. government funding). Other reasons for hampering interaction were differences in organisational culture (i.e. time vision; organisational structure). A CivRep sums it up:

> "There was a mutual tension between the NGOs and us, therefore, collaboration took place based on inter-personal relationships. However, the security situation throughout the province was very fragile, making it very difficult for them to operate outside the ADZ's. What we have learned is that if you want the development activities to be sustainable, and to reach out to the local people, you need to do it with the IOs and NGOs, the TFU could not do that alone. NGOs can do their work when the area is secure enough. There you see the potential cooperation between the civilian and the military that could lead to concrete results". (TFU HQ, R8).

The interaction with the local Afghan actors also took place through the PRT. Both the C-TFU and CivRep had their own relationships with government officials such as the governor of Uruzgan province. The institutional structure for this interaction was non-hierarchical (i.e. mutual influence). The mode of communication was agreement by bargaining or arguing. The underlying motives were both instrumental and relational. The TFU had to support the local Afghan government with stabilising and reconstructing Uruzgan province. Accordingly, the Dutch intended to establish 'an Afghan face' to their operations in order to enhance the credibility of the Afghan government. Although this illustrate the Dutch their awareness in regard to the importance and long-term effectiveness through local ownership, they failed to understand that the local authorities selected were contested by the local population (Grandia, 2015). This may have complicated the interaction between the TFU and the local population even more. One could argue if this was not the result of ineffective Dutch high level politics which was aimed at shaping the operating environment with the intent to create favourable conditions for the TFU in which it could achieve its goals. This argument is formed around the fact that the Dutch government (as described above) upon agreeing on the TFU mission successfully secured the removal of Jan Mohamed Khan as official Governor of Uruzgan province. The Dutch subsequently negotiated the removal of the provincial chief of police Rozi Khan, who as a member of the Jan Mohamed Khan government, was considered a potential risk to the interaction between the TFU and the local population (Ministries of Defence, Foreign Affairs and Development Cooperation of the Netherlands, 2005). According to Kitzen (2016) this high level diplomacy "could be understood from the perspective of long-term state building, which requires independent institutions free of local influences, its short-term ramifications in Uruzgan were devastating for the fragile counterbalance against Jan Mohammed Khan's network; the sacking of Rozi Khan left Matiullah Khan's Afghan Highway Police (AHP) – which was not touched by Dutch diplomacy – as the only capable force in the province and thereby seriously weakened the position of Governor Munib (p. 379). Hence, these decisions were primarily based upon poor intelligence over the local context of Uruzgan province and resulted in an increase of OMF activities and a subsequent deteriorated security situation (Green, 2012).

The role of experts and particularly of the tribal advisor was recognised as key to supporting this interaction since the TFU severely lacked an understanding over the local context. Interestingly, to better understand the local-context of Uruzgan Province, a so-called civil-assessment of the province was conducted by an Afghan NGO, The Liaison Office (TLO) through the Dutch Embassy in Kabul. One could describe the civil-assessment as a method for actor analysis, commonly known in strategic management literature as stakeholder analysis (Grimble and Chan, 1995; Bryson, 2004). In short the civil-assessment consisted of ethnographic fieldwork and was conducted between May and June 2006. The findings of the assessment were used by the embassy to develop a context analyses that outlined how to strategically engage communities through development activities (TLO, 2006; Royal Netherlands Embassy in Kabul, 2006; Grandia, 2015; Kitzen, 2016). Although the civil-assessment seemed a solid initiative from the Dutch to enhance their understanding over the local context. Although this report was sent by TLO to the Dutch Embassy in July 2006 it only became available to the TFU in August 2006 and the mission had already started. Consequently, the outcomes of the civil assessment arrived too late to have an impact on the TFU's initial planning.

Some of the private firms involved were an element of the TFU itself. There were for example private firms which contributed to the security of TFU's compound by deploying Unmanned Arial Vehicles (UAV). There were also firms responsible for part of the logistics such as food and water. The relationship between the C-TFU and the personnel of these private firms was functional, since they had established a contract. The collaboration motives were instrumental since the Dutch government hired them for several reasons. First, they had unique resources which can be deployed quickly. Second, their services were cheaper. The private firms, obviously collaborated with the TFU to make profit. This typical entanglement of maximising wealth of private firms and the requirements to involve a range of stakeholders from Uruzgan province as well as from the Dutch government in the interaction, is challenging. Other private firms with whom the TFU interacted focused on deploying resources and activities into the actual province. One private firm supporting the "saffron project" - meant to support the Afghan farmers replacing their agriculture activities from poppy into saffron - was mentioned several times. Through this business model they intended to make profit and at the same time create a better situation for the Afghan people. As described by a CIMIC officer:

> "Promoting the growth of saffron instead of poppy. Saffron will ultimately provide more revenues for the farmers themselves. The starting cost was paid by the Dutch ministry of foreign affairs. For these projects the TFU used civilian entrepreneurs from the Netherlands to support the education of local Afghan entrepreneurs. These projects are part of the tasks the International Development of Entrepreneurial Activities (IDEA) had. Their projects involved socio-economic development and entrepreneurial activities through providing micro credit to local Afghan entrepreneurs. It was a partly commercial project, and the training was done through the PRT". (PRT, R25).

Therefore, we suggest that the diversity amongst the various sub-systems of the TFU and between the mission and the other systems involved are scattered over the three domains of the Cynefin framework. An

overview of the analyses of uncertainty and the predictability of the TFU's condition as complex system while applying the framework is presented in figure 5.6.

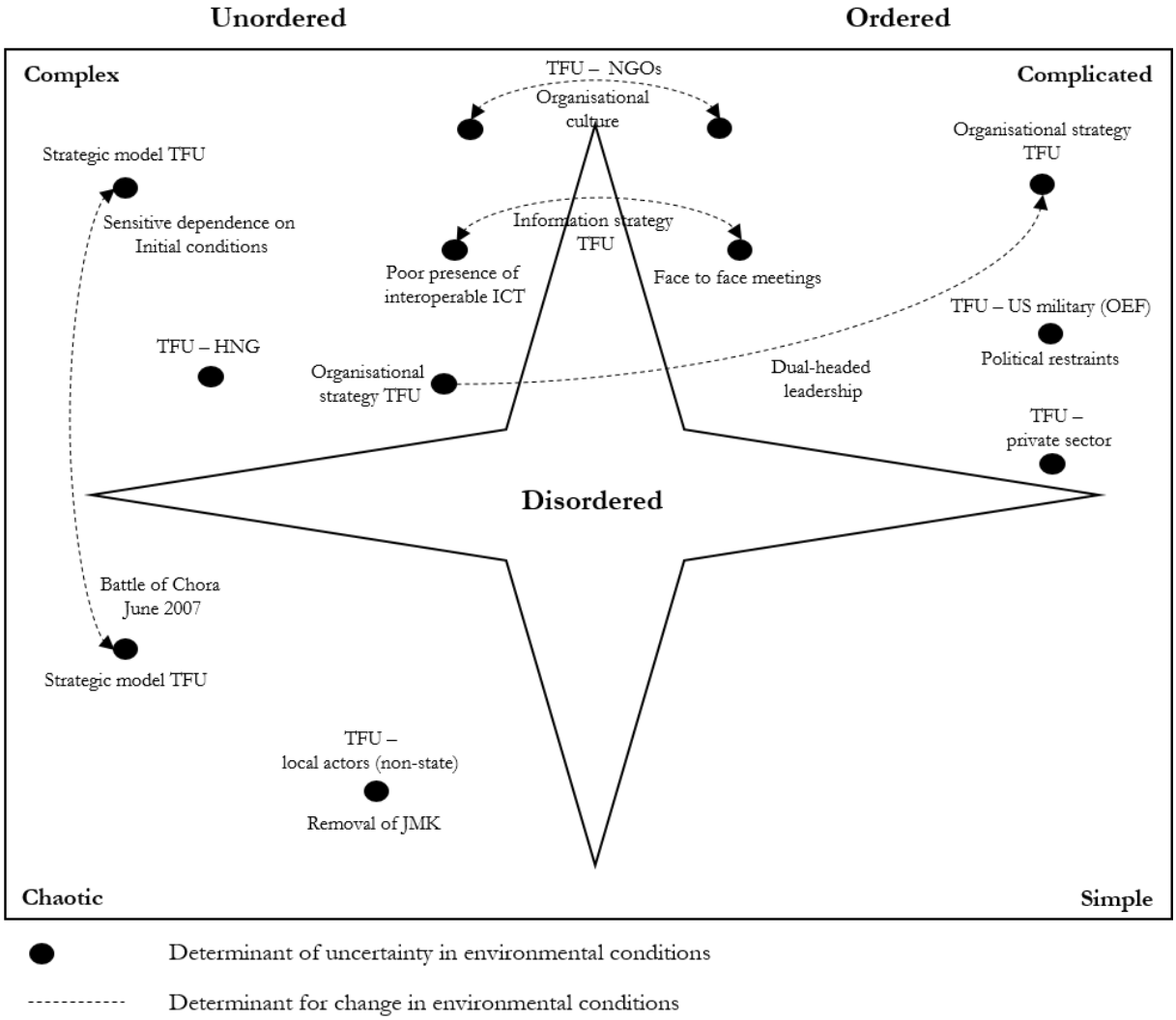


Figure 5.6: The predictability of the TFU's condition as complex system applied to the Cynefin framework.

To summarise, the TFU can be understood as complex system that is heavily impacted by different types of uncertainty derived from its internal organisation as well as the external environment. The impact uncertainty (i.e. sensitive dependence on initial conditions and *equifinality*), modelling uncertainty (imprecise knowledge on how to control input), uncertainty about relations between actors, environmental uncertainty (i.e. unpredictable events and factors beyond control) and uncertainty about outcomes can be divided in two dimensions, namely complexity and change. Internal and external complexity relates to a number of issues to which the TFU had to attend and the degree to which they were interconnected. Internal and external change relates to the degree of discontinues change that occurred within the TFU. Furthermore, internal and external uncertainty can be categorised in four distinct domains (Duncan, 1972). Figure 3.3 illustrates the four dimensions and corresponding levels of internal and external uncertainty. Hence, we

conclude that the complexity and discontinuous change that characterised the strategic model and system diversity of the TFU as well as the operating environment resulted in a high level of both internal and external uncertainty.

Accordingly, proposition 1a and 1b are supported by the case study:

Proposition 1a:
The uncertainty derived from the internal organisation impacts the predictability of a system's condition.

Proposition 1b:
The uncertainty derived from the external environment impacts the predictability of a system's condition.

In the next section, we will discuss how the TFU acquired information from the environmental conditions, and interaction with its environment to describe the need for emergent behaviour and self-organisation to cope with this uncertainty.

5.4 SELF-ORGANISATION AND THE FACTORS OF DIFFERENTIATION AND INTEGRATION

The logic behind complex systems is that new ideas and concepts must be explored and formulated in response to stimuli from inside or outside the system's boundary by developing schemata (Gell-Mann, 1994). Moreover, Taylor argues that "if the input of the so-called real world cannot be effectively processed, the schema either adapts or becomes obsolete (p. 206). This logic is increasingly important in stabilisation operations where the real world is uncertain, ever-changing and unpredictable. As described by King (2000), the complex system needs to remain open to structural and behavioural change "since the system has to cope with unpredictable change in the environment, the development of the structure cannot be contained in a rigid [deterministic] programme that controls the behaviour of the system" (p. 79). Consequently, a system can reach points of bifurcation and new high order, more differentiated, structures may emerge (Urry, 2003). In the context of this study, a system's self-organising ability to differentiate and integrate its sub-systems, organisational resources and competencies (i.e. bifurcation and emergence of new order and structures) serves as the representation of this structural and behavioural change.

Reflecting on the strategic documents (i.e. the TFU masterplan, focal paper and UCP) that described the activities the TFU needed to conduct illustrates the requirement of a combination of expertise from its various sub-systems and other systems of the supra-system. The three ENDS (safe and secure environment; socioeconomic development and governance) and their seven derivative LoE (security apparatus; secure areas; infrastructure; basic living conditions; health & education; economic diversity and governance support & capacity) described in the focal paper and UCP, only one – safe and secure environment - relied heavily

on the BG, whereas the others – socioeconomic development and governance – required substantive input from the PRT, IOs, NGOs, host nation government as well as local actors. This division of labour was clearly illustrated through the organisational design of the TFU (i.e. differentiation of sub-systems) characterised by its classic hierarchical institutionalised structures. However, as described previously, the fact that the Dutch government labelled and presented the TFU politically as a non-kinetic stabilisation and development operation was experienced differently by most interviewees. Consequently, the realities on the ground proved it difficult to establish neatly delineated roles and tasks of the sub-systems and other systems. Instead, the TFU organise and conduct in an environment that was balancing between 'permissive' and 'non-permissive' (i.e. hostility within the operating environment) with a form of hybrid division of labour that requires certain relationships between sub-systems and systems. This reflects on the general assumption that certain preconditions in terms of security provide ground for political, social and economic development, or as described in a Defence White Paper (2000) ". . . An integrated approach is necessary also for stabilisation and reconstruction after cessation of fighting. Diplomatic, economic, humanitarian and, if needed, military instruments need to be deployed in an integrated fashion. . . . Defence and development aid go hand in hand. The military was there to set the proper conditions" (p. 25). In other words, the TFU experienced several points of bifurcation since foresights were unpredictable and hence differentiation and integration was depending on the system's condition. One of the problems for the TFU was that the complexities of the relationships, due to structural and behavioural change, were difficult to understand, let alone predict. This situation perfectly illustrates our argument for introducing the non-linear sciences to cope more effectively with the realities of multi-actor interaction during stabilisation operations which provides ground for self-organisation through the factors of integration and differentiation.

As discussed in the presentation of the conceptual model, self-organisation depends on the presence and impact of two distinct types of enabling conditions. First, systems must consist of sub-systems that are compatible, that is the feasibility of the relationship. Second, in order to create a unified effort, sub-systems must be integrated. That is, the desirability of the relationship. We argue that the compatibility and integration effort is determined by non-linear feedback mechanisms that will display unpredictable emergent behaviour. Below, we will present several distinct examples to illustrate, to a limited extend, the TFU's self-organising ability to differentiate or integrate its own sub-systems, organisational resources and competencies and with those of other systems as part of the supra-system. Representations will be presented by using the Cynefin framework.

5.4.1 "Simple" situation

According to the propositions made in chapter 3 we would expect that systems that find themselves in the ordered situation of "simple" are mainly driven by negative feedback controls within both the formal and informal organisation. As a result, a single system is expected to be integrated (i.e. strong centralised) while the supra-system will be differentiated (i.e. weak distributed). Additionally, since the relationship between cause and effect is expected to be "clear" (i.e. low-level of uncertainty) the volume of information which

needs to be distributed is low. Hence, the organisation design strategy is expected to be characterised by rules and programs, hierarchical referral and goal setting.

According to the findings presented in the previous section, the TFU did not find itself in the ordered domain of "simple". The reasoning for this is twofold. First, the TFU was unsuccessful to design and implement an information strategy that supported their organisational and business strategy as part of their strategic model. As a result, internal and distributed information processing was hampered by the absence of a general information system or database with access to all the TFU's sub-systems as well as other systems as part of the supra-system. Moreover, external distributed information processing was hindered due to cultural differences causing daily friction and actors behaving strategically to maximise their own interests and subscribe to different priorities. As a result, the number of potential interrelationships, coalitions, issues and conflicts increased exponentially. Finally, the uncertainty of the operating environment prevented the TFU to completely understand the cause and effect relationships throughout the overall province.

5.4.2 "Complicated" situation

In the situation of "complicated" we proposed to find systems whose formal organisation is mainly driven by negative feedback controls while their informal organisation is expected to be potentially driven by positive feedback controls. Hence, we expected to find a single system to be integrated (i.e. strong centralised) as well as connections with other systems (i.e. strong distributed). In addition, we expect that the distribution of information will increase since cause and effect relationships are "complicated". In other words, with sufficient time, information and resources, actors should be able to understand these relationships and use them to forecast. Therefore, we expect to find an increase in information processing capacity through the investment in vertical information systems (i.e. strong centralised) as through the creation of lateral relationships (i.e. strong distributed). These expectations are partly supported by the case study. The following examples are used to illustrate the application of these non-linear feedback controls within these interactions and their subsequent impact on the enabling conditions for differentiation and integration.

Integration through environmental demands. First, integration was observed that was determined by environmental demands. In other words, information from outside the system's boundary was received and then transformed by positive feedback controls into outputs. We illustrate this transformation of information and subsequent form of emergent behaviour with the following example: 'during reconstruction activities in the province where the security situation was very fragile (i.e. 'non-permissive' environment), BG infantry platoons safeguarded PRT mission teams during reconstruction activities. Hence, integration occurred because certain capabilities of these two sub-systems matched and were in alignment and thus could operate as a system, that is, they were compatible. The fragile security situation hampered the PRT's freedom of movement throughout the province, in turn, positively influencing the TFU's management (i.e. TFU HQ, BG and PRT) to stimulate integration. Thus, the relationship was desirable. In addition, the TFU HQ served as a catalyst by providing the necessary facilitating conditions (e.g. providing 6 month roadmaps;

holding daily meetings) to assure the two sub-systems were compatible (i.e. in accordance with the TFU's goals).

However, the relationship between the BG and PRT was tense. This was mainly due to differences in military background and derivative ways of operating, specifically in their focus on intelligence processes. The commanders of the two sub-systems typically had an infantry or engineer corps background respectively, hence the BG was primarily enemy-centric, by contrast, the PRT was more population-centric (Kitzen, 2016). Additionally, discussion took place between the two sub-systems over who became the leading unit, in military terminology supporting – supported. It was the responsibility of the C-TFU to define the tasks and roles between the two sub-systems and appoint the leading sub-system. Therefore, we conclude that the integration effort was a consequence of the hierarchical relationship between three sub-systems. The relationship was thus desirable from the TFU HQ perspective.

The compatibility and integration effort extended even further than the organisational resources and competencies of the BG, PRT and TFU HQ. For the same reasoning as mentioned above, namely the fragile security situation, this joint patrols could be complemented with helicopters from the ATF, who in turn, safeguarded the joint patrol from the air. Again, the organisational resources and competencies of the three sub-systems matched and were in alignment and hence were compatible. The integration effort was ensured since the integration of these three sub-systems was supported by the TFU HQ who had a hierarchical relationship with the sub-systems. Again, the relationship was desirable from the TFU HQ perspective.

Integration through necessity. Second, the TFU had to deal with scarce resources for its operations, making resource-dependency a key motive for integration. Therefore, joining and coordinating the deployment of organisational resources and competencies were more efficient. As a CivRep stated:

> "We were operating with very scarce resources. We only had so many armoured vehicles for so many things we could use it for. Whether an armoured vehicle was used for a certain patrolling activity that day or for a visit to the governor. These types of choices were considered in terms of what was most necessary that day". (TFU HQ, R8).

Integration through emergent behaviour. A third and very specific example of integration was observed in a situation where information from inside the system's boundary was received and then transformed by positive feedback controls into outputs: the command and control process of the TFU HQ appeared to be inefficient. Consequently, in 2008 the command of the TFU was partly handed over to a CivRep and thereby making the TFU HQ dual headed (Mollema and Matthijssen, 2008). This example perfectly illustrates that by following the positive feedback loop, disturbances were amplified and thus moved the TFU further away from its point of origin, to a point of bifurcation where a more differentiated structure emerged. This bifurcation was not the outcome of prior shared intentions but rather it was the result of complex interactions between the sub-systems (through self-organisation and emergent behaviour) in the absence of prior shared intentions. The unique situation in which a civilian official co-commands a military unit

perfectly illustrates that sub-systems must be compatible in terms of organisational resources as well as competencies if they are combined in such a fashion. A CivRep explains:

> "The TFU was civilian-military led by both a CivRep and a military commander. Each had very different responsibilities. Needless to say, it was not my task to lead the military operations but yet all decisions were taken by the two persons together. Whenever a decision had to be made it was discussed from both a military and a civilian perspective. The different perspectives were compared and then based on that integrated approach a decision was taken". (TFU HQ, R9).

The type of change in organisational structure with relatively low levels of standardisation, formalisation and role specialisation was also found by Lawrence and Lorsch (1973) in their study of governmental departments facing the highest levels of uncertainty on the one hand and lowest numbers of management and use of formal control system on the other.

Differentiation through design. Conversely, differentiation was found in situations that simply not required integration between two or more sub-systems. In other words, there was no stimuli from either inside the system boundary or from outside the system's boundary to conduct the *ex-ante* assessment in order to determine potential compatibility and integration effort. These findings perfectly match the organisational design strategy of the TFU which was based upon on a clear division of labour with hierarchical institutionalised structures (Ministries of Defence, Development Cooperation and Foreign Affairs of the Netherlands, 2005).

Differentiation through self-interest. More importantly, however, differentiation was found in situations where actors of a sub-system demonstrated instable behaviour by ignoring the TFU HQ's response to stimuli from outside the system's boundary, namely the unstable security situation, and thereby potentially settling the whole system into unordered or more dangerously disordered conditions. A commander TFU explains:

> "The people from the Ministry of Development Cooperation had a different agenda and therefore they looked completely different at the security situation in the Province. To mention an example: there was an employee of them who said she wanted to look in the village of Tirin Kot. There was no permission for such visit due to the unstable security situation at that time. There was a project of an ambulance that was restored and it could bring wounded Afghans to the Dutch compound if needed. One day she simply dressed into a burka and got in that ambulance and then went into the village. And no one knew about that trip. The moment she came back to the base everyone was let's say "surprised"…". (TFU HQ, R2).

A complex system remains open to changes in response to information received from its environment, closing on themselves must be avoided at all cost (Bousquet, 2009). The fact that the TFU was politically framed as a stabilisation and reconstruction operation could potentially have resulted in a dangerous state if the TFU had indeed ignored the information received from its environment. Fortunately, the realities on the ground quickly made the TFU HQ and its sub-systems realise they were facing a COIN mission which required different operational processes, *inter alia*, goal-setting, decision-making and tactical procedures.

Although the TFU did recognise the tension derived from the political debate back in the Netherlands whether it was a COIN mission or not, it perceived the situation as one of being the very condition of change and creativity. Thus, the TFU used information (i.e. schemata) as the key operating process through which the change of its behaviour and organisational structure took place. This illustrates our argument to view stabilisation operations as complex open system with non-linear interaction with its environmental conditions, receiving input, processing the input, and finally exporting outputs. Such an input – transformation – output model should be characterised by its non-linearity, emergent behaviour and ultimately self-organisation, all depending on a system's condition.

In sum, interactions that take place in the "complicated" domain require strong centralised and strong distributed connections. We expected to find that strong distributed connections would result in a single system to be integrated. Additionally, systems driven by positive feedback controls, were expected to positively impact both the compatibility and integration effort of systems to interact and hence would integrate with each other. Furthermore, both sub-systems and systems in the "complicated" situation were indeed compatible. However, regarding the integration effort an important distinction has to be made whether the integration effort is based on rational choice or determined by the external demands. Whereas the former (driven by negative feedback controls) is more likely to differentiate and the latter (driven by positive feedback controls) is more likely to integrate.

5.4.3 "Complex" situation

In the "complex" situation of the unordered domain we expect to find systems that are mainly driven by positive feedback controls characterised by increased levels of interaction and communication between two or more systems (i.e. weak centralised and strong distributed). Moreover, to cope with the high uncertainty by which the "complex" situation is characterised large amounts of information need to be processed. Thus, we expect to find an increase in information processing capacity through the creation of lateral relations (i.e. strong distributed). Again, these expectations are only partly supported by the case study. It was found that the TFU was characterised by various interactions that were found in the "complex" situation of the unordered domain. The following examples are used to illustrate the application of these non-linear feedback controls within these interactions and their subsequent impact on the enabling conditions for differentiation and integration.

As described above, the instable behaviour demonstrated by actors of a sub-system could have led to potentially unordered or even disordered conditions. A distinction needs to be made whether this instable behaviour is demonstrated by the formal or informal organisation. In this particular example the instable behaviour was part of the formal organisation since visiting Tirin Kot was part of the daily activities of the TFU. However, we argue that for stabilisation operations to be effective, the formal organisation needs to demonstrate stable behaviour, securing ordered conditions for executing daily operations. By contrast, the informal system can potentially display instable behaviour, securing unordered conditions to promote change and adaptation to stimuli from either inside or outside the system's boundary. Thus, for a system to

be changeable it requires a state of bounded instability. An excellent example of such bounded instable behaviour was mentioned by some of the interviewees:

Integration through a sense of urgency. While former governor and warlord Jan Mohammad Khan – at the start of the TFU in 2006 – was forced to resign as provincial governor, he still had a strong influence since his cousin Matiullah was the chief of the Afghan Highway Police. However, the commander TFU recognised that his US and Australian partners cooperated with both men. As a result, the commander decided (with permission of the Dutch Government) to have covert meetings with Jan Mohammad Khan to gain some influence as well. The commander did not participate in these meetings personally due to their sensitive character. Therefore, the commander of the PRT took upon this task. In sum, while the TFU's formal system demonstrated stable behaviour (conducting daily operations), the informal system, in turn, demonstrated instable behaviour in order to integrate with Jan Mohammed Khan. Consequently, although the relationship was undesirable from the TFU's point of view, integration occurred through a sense of urgency.

Integration through local-ownership. A second example of integration were the micro-finance projects managed by the PRT (i.e. Integrated Development of Entrepreneurial Activities (IDEA)) aimed at stimulating socio-economic development. These projects – so-called 'track 1' quick and visible (development) projects (QVPs) were initiated by the PRT (CIMIC) and focused on local actors who wanted to start a small business. 'Track 1' QVPs were mainly conducted within the ADZs. The personnel of the PRT were acting as consultants to the local actors. These projects were financed through the Dutch Embassy in Kabul while the local actors held ownership over the project. Additionally, the NGOs could also participate in these projects or initiate them by themselves. Requests for funding were to be made through the Embassy. Interestingly, an important bifurcation was observed in regards to the integration between the PRT and the local NGOs and Afghan population. Parallel to the 'track 1' QVPs within the ADZs, so-called 'track 2' QVPs were conducted outside the TFUs oil spot. 'Track 2' QVPs are covert reconstruction activities initiated by the Dutch Embassy in Kabul and were implemented through local actors who were close to the local population. Due to the sensitivity of these activities and the importance to protect the local participants the existence of this program was not publicly known to the biggest part of the TFU. Consequently, the program's activities were not included in the TFU's campaign plan nor were the activities aligned with those of other units that were part of the TFU.

Differentiation through cultural differences. As we have learned throughout this study, circumstances vary so enormously during stabilisation operations that a vast array of factors that determine self-organisation need to be appreciated. Organisational culture was found to be an important factor for a state of differentiation between the TFU's sub-systems and between the TFU and other complex systems. For example, integration between the TFU and a NGO was not realised since the TFU governmental affiliation and a NGOs neutral character were incompatible due to a lack of integration effort.

> "For good collaboration, there must be the desire to collaborate and a common idea on what you collaborate on and what you can share with each other. That is more a political decision from the organisation of what we can offer and what we expect from others…These are often personal processes that also have to do with trusting each other, knowing each other personally and also knowing which information the other could use and which information can be shared". (TFU HQ, R14).

Other NGOs acted more pragmatically and stood open for some form of interaction due to instrumental motives (e.g. government funding or resource dependency) resulting in the exchange of information and contingency planning for potential crisis situations:

> "There are arrangements in case of emergencies and evacuations that you can find each other in such a situation". (TFU HQ, R14).

Differentiation through political constraints. Another example of incompatibility was observed between the U.S. military units deployed into Uruzgan province operating under the mandate of Operation Enduring Freedom (OEF) and the TFU operating under the ISAF mandate. The C-TFU had received orders from his leadership in the Netherlands not to collaborate, but to "only support in extremis" (an example will be described below). Consequently, incompatibility occurred due to political constraints. In the language of systems theory, the values of the properties were incongruent (Orlikowski, 2000).

5.4.4 "Chaotic" situation

For systems who find themselves in the "chaotic" situation the Cynefin framework argues for both weak centralised and distributed connections. Accordingly, in these situations systems should focus on establishing order through a top-down approach with no time for investigation or asking for input. As a result, the management structure is strong centralised with weak or non-existent distributed connections between the various systems, without any form of connection feasible. Thus, the various systems are expected to be in isolation. In order to deal with the high-level uncertainty (i.e. unclear cause and effect relationships) we expect to find systems that focus either on the reduction of information processing needs or on an increase in information processing capacity. These expectations are partly supported by our findings.

During the battle of Chora, fighting occurred between coalition forces (e.g. the TFU, US military as part of OEF as well as the ANA) and the OMF. Both sides sought to gain control over the district of Chora which was of strategic value for both sides. After a few days of intensive fighting the OMF withdraw from the district. The fighting resulted in the tragic loss of 16 Afghan soldiers, 1 American, 2 Dutch and reportedly 71 OMF fighters. Sadly an estimated 58 civilians lose their life as well. Hence, the TFU had to deal with cause and effect relationships that were very unclear and from which they could not be isolated. Consequently, order was established through a top-down approach centralised management structure (i.e. TFU HQ). Contrary to our expectations, the TFU, through its centralised management structure, was able to maintain strong distributed connections with other systems as part of the supra-system (e.g. IOs, NGOs and the US military).

5.4.5 Disordered domain

The systems that are facing the disordered domain are expected to remain the *status quo* until they are pushed into one of the other domains by self-organisation or management efforts. However, the TFU did not find itself in the disordered domain.

In table 5.2 we present an overview of the TFU's self-organising ability to differentiate and integrate its resources through the ex-ante assessment of the enabling conditions. Representations are presented by using the Cynefin framework.

Table 5.2: TFU and the factors of integration and differentiation.

Situation according to Cynefin	Expectations	Findings
"Simple"	Single system to be integrated	Not supported (lack of data)
	Supra-system to be differentiated	Not supported (lack of data)
"Complicated"	Single system to be integrated	Compatibility supported by data Integration effort partly supported by data*
	Supra-system slightly integrated	Compatibility supported by data Integration effort partly supported by data* * distinction between intentional choice (i.e. design) and determined by the environment)
"Complex"	Supra-system to be integrated	Not supported * Additional finding: integration effort positively impacts compatibility
"Chaotic"	Single system integrated	Supported
	Supra-system differentiated	Not supported
"Disordered"	*Status quo*	Not supported (lack of data)

We argue that the TFU should be understood as a complex open systems composed of multiple sub-systems that interact in a non-linear fashion, in turn impacting its condition from inside the system's boundary. Furthermore, the TFU was exposed to a highly complex, dynamic and uncertain environment from which it could not be isolated, thus impacting its condition from outside the system's boundary. As a result, the TFU demonstrated bounded instable behaviour (i.e. non-linear feedback mechanism) resulting in the dynamic equilibrium of its condition. This behaviour is partly the outcome of rational choice or determined by environmental demands.

Accordingly, proposition 2 is supported by the case study:

Proposition 2:
The dynamic equilibrium of a system's condition is expected to positively impact its required self-organising ability.

Integration occurs when either the feasibility or desirability, or both, of the ability of sub-systems or systems to interact is positive. By contrast, differentiation occurs when the *ex-ante* assessment of the ability of sub-systems or systems to interact is negative. In other words, sub-systems require several modifications in order to allow for interaction.

Therefore, proposition 3 is supported by the case study:

Proposition 3:
A system in dynamic equilibrium is expected to be mainly driven by non-linear feedback controls, thereby enabling its required self-organising ability to differentiate or integrate.

5.5 CONDITION-DEPENDENT CAPABILITIES

Self-organisation or co-evolution (i.e. differentiation and integration) is the result of the *ex-ante* assessment of the enabling conditions. Ideally, the systems involved share information which subsequently leads to a state of shared awareness amongst the supra-system and then provides ground for the identifying threats and opportunities, and identifying potential resource compatibility. This is known as the process of "schemata" (Gell-Mann, 1994). Being responsive to the outcomes of the *ex-ante* assessment relates to the planning of potential activities to the situation observed (i.e. needs, threats and opportunities) including those from an integrated or differentiated perspective. Having shared awareness over the operating environment is thus important, as a commander PRT explains:

> "If we deployed our factors into a certain area to provide security, it is very important to have a good understanding of what the other agencies, reconstruction teams or NGOs are doing during this military operation, but this also after securing part of the area. So, the importance is not only of having a successful military operation, but also to stress the importance of the follow on". (PRT, R22).

Unfortunately, as we have illustrated in section 5.3.1 the TFU did not succeed in creating a state of shared awareness due the absence of their information strategy. However, as presented in the previous section, it possessed, to a limited extent, the self-organising ability to differentiate and integrate its resources. As a result, sub-system capabilities were formed through the relationships between the organisational resources and competencies from an individual subsystem (e.g. daily activities from the TFU HQ, BG, PRT etc. in isolation). Additionally, system capabilities were formed through the integration of the organisational resources and competencies from two or more systems in a relationship (e.g. the joint patrols of the BG and PRT supported by the ATF or the dual-headed leadership of the TFU-HQ). Finally, supra-system capabilities were formed through the integration of the organisational resources and competencies of two or more systems (e.g. the covert talks between the C-PRT and Matiullah and (reconstruction activities of the PRT (including 'track 1 and 2' QVPs), various NGOs and local businesses funded by the TFU).

Accordingly, proposition 4 is supported by the data.

Proposition 4:

System's self-organising ability to differentiate and integrate positively impacts the development of condition-dependent capabilities.

5.6 OUTCOMES

As described in section 5.3, the ISAF mission statement and high-level policy white paper were perceived by most interviewees as abstract the ENDS hardly measurable. Similar results were found by Rietjens et al. (2013) who suggested that "ambiguity led to a lack of common understanding of the goals and tasks of CIMIC among different contributing nations, rotations and military command levels within ISAF" (p. 345). We argue that this perception was caused by too much focus of the TFU on the traditional linear strategic model driven with its overemphasis on ENDS. The TFU attempted to translate the ISAF mission statement and high-level policy white paper into a strategic model which would describe the attempted achievement of desired political ENDS (i.e. a desired situation in terms of objectives), through the choice of suitable strategic WAYS (i.e. the 'how' in the form of a concept), employing largely the TFU's MEANS (i.e. policy instruments by which some ENDS can be achieved).

As a result, outcomes were measured by adopting Results-Based Management (RBM), a performance management system known in the private sector (Try & Radnor, 2007). More specifically, the TFU translated RBM to Effects-Based Operations (EBO) which is applied in practice through an implementation plan that consists of seven phases (NATO, 2006). As described in section 5.3.1, the initial TFU Master Plan was based on 4 lines of operation (Governance & Justice; Security & Stability; Development; Credible TF). Goals were formulated for 6 months + 2 months overlap due to the rotation rhythm. Every rotation applied this mechanism. By using an Effects-based Approach to Operations (EBO) the 'Master Plan' described the overall effects that were critical to mission success. Interestingly, the TFU applied a different framework than RC-S HQ and ISAF HQ respectively. Whereas the former defined 23 effects, the later defined 11 effects. According to several respondents the exact content of these effects differed considerably. This situation potentially hampered the horizontal comparison between different provinces made by higher HQ's and disrupted the vertical alignment between the tactical and operational level within the ISAF mission. Moreover, within the ISAF mission, the definition of effects served as the starting point from which each hierarchical level formulated seven Measures of Effectiveness (MoE) and performance (MoP) (Rietjens et al., 2011). Again, differences between the TFU and other sub-systems of ISAF were found. An important reason for these differences was the fact that each Task Force was controlled by, and held accountable to, their respective home countries. Another difficulty with applying EBO within the TFU was that its existence and application were not known throughout the Task Force.

Moreover, in order to determine the exact outcomes one needs to identify cause and effect relationships. According to many respondents this was a difficult task and even when it was possible to determine a certain outcome, it often was impossible to identify what had caused the outcome. This is mainly due to the

interconnectedness and nonlinear relationships in the complex system. The interconnectedness and nonlinearity (it goes in all directions) is perfectly illustrated by the 'TFU Master Plan', its lines of operation and desired effects which is presented in figure 5.4.

Finally, it is questionable if certain outcomes could be labelled "positive outcomes" due to the fact that the participating systems had different views of a situation and subscribed to different priorities and preferences for particular solutions. Moreover social complexity resulted in different options in regards to what was fair and just in policy making. We illustrate this with the following three examples:

The TFU developed several projects by itself or through integration with other systems. The so-called "saffron project" was meant to support the Afghan farmers replacing their agriculture activities from poppy into saffron. This project was an integrated effort from the TFU HQ, PRT and international as well as local private firms. The purpose of this integrated business model was to generate alternative income for the local Afghan farmer while simultaneously creating a better situation for the Afghan people. A CIMIC officer specifies the importance of these projects:

> "Promoting the growth of saffron instead of poppy. Saffron will ultimately provide more revenues for the farmers themselves. The starting cost was paid by the Dutch Ministry of Foreign Affairs. For these projects the TFU used civilian entrepreneurs from the Netherlands to support the education of local Afghan entrepreneurs. These projects are part of the tasks the International Development of Entrepreneurial Activities (IDEA) had. Their projects involved socio-economic development and entrepreneurial activities through providing micro credit to local Afghan entrepreneurs. It was a partly commercial project, and the training was done through the PRT" (PRT, R25).

From the TFU's perspective, we can expect this was a positive outcome. A second project that was mentioned by most of the interviewees was one that focused on the production of carpets and then selling them. Like the saffron project, this particular project was focused on supporting small scale socioeconomic development through microfinance. At first hand, the project appeared to be a success since many several carpets were produced. However, as it turned out at a later stage, the TFU was unaware that the carpets were actually made by children. Hence, from the TFU's perspective, it is questionable of this production process was a positive outcome.

From the Dutch perspective it appeared that there were strategic motives for participating in the TFU mission that were not directly linked to the mission or Afghanistan in general. This was observable in public debate when several political leaders indicated that the Dutch participated in the TFU mission due to Dutch ambition to participate in the G20 (economic) Summit. In a high-level policy white paper (2009), the Dutch Embassy in Washington wrote that: "Prime Minister Balkenende understands that the Dutch were invited to the Pittsburgh G20 Summit because of their role in Afghanistan, where they are viewed as a serious partner who shoulders their international responsibilities" (p. 2). From the perspective of the Dutch government, thus, receiving the invitation for the G20 Summit because of their role in the TFU was a positive outcome.

The above paragraphs clearly illustrate that, as most stabilisation operations, the TFU had to deal with so-called 'wicked problems' with policy outputs and impacts that were difficult to observe and measure. Interestingly, the Dutch government stressed the abstraction-level of the ENDS in their high-level policy white paper due to the uncertainty of the environmental circumstances in Uruzgan province (Ministries of Defence, Development Cooperation and Foreign Affairs, 2005).

Indeed, organisations that must deal with 'wicked problems' hold important management implications (Tomkins, 2005) such as dealing with ambiguous, intangible and changing goals, are experiencing difficulty with establishing performance standards and measuring results (Wilson, 1989). Consequently, strategic management tools are only applicable to a very limited extend (Davids, 2011; Muggah and Sang, 2013). Therefore, and contrary to most contemporary literature on stabilisation operations (Farrell et al., 2013; Grandia, 2015; Kitzen, 2016) and interpretation of most interviewees, we argue that the abstract ISAF mission statement and high-level policy whitepaper fits perfectly with the uncertainty derived from the environmental conditions resulting in dealing with the so-called 'wicked problems', in turn, providing ground for an inherent order that identifies and models a system's overall behaviour through adapted and acceptable WAYS.

Indeed, TFU HQ made a change in strategic thinking driven by the change in environmental conditions during the four year deployment of TFU. Kitzen et al. (2013) summarises these changes in strategy as follows: "while the Master Plan was designed to foster security and development in the entire province within two years, the Focal Paper provided a much needed adaptation to the harsh reality of campaigning in Uruzgan. The Focal Paper not only acknowledged that the military was not merely providing security and development assistance, but actually involved in COIN, and also set some more realistic targets by focusing TFU efforts for the additional two years of the mission to the three main ADZs. Finally the UCP was formulated to arrange a smooth transfer of authority from the Dutch TFU to the local government and the ISAF successors" (p. 172).

It was Von Clausewitz (1832) who studied strategy by looking at the looking at the nature of the whole. He argued that once war begun the opponents would start battling each other, and more importantly, so would their policies. Hence, this reciprocity creates its own dynamic which can have consequences that are different from the policies that were meant to be guiding it (Strachan, 2007). Hence, the strategic model of war, including the business, organisation and information strategy, are subject to change.

It was the sensitivity to the initial conditions that provided ground for an inherent order that identified and modelled the system's overall behaviour through adapted and acceptable WAYS. The *equifinality* of open systems enabled the early on bottom-up planning at the tactical level (i.e. TFU HQ) during the process of self-organisation. However, this emergent bottom up planning was never truly recognised as the official strategy for the TFU, nor did the political level held ownership over it (Grandia, 2015). Furthermore, initial strategic thinking of the TFU was dominated by the Dutch political climate and its fear for public opinion Farrell et al., 2013). Consequently, the Dutch government engendered difficulties in trying to communicate

the purpose of the TFU to the Dutch population since the strategic narrative of the mission was not apprehended by the Dutch population (Farrell et al., 2013; Kitzen, 2013). Finally, the realities and complexity of the operating environment heavily impacted the TFU, eventually resulting in a distinct deviation from the initial political guidelines.

In sum, the TFU was inherently complex and as a result no fixed standards that provide a roadmap of how to achieve the intended objectives and end-states were available. Thus, although we argue that the condition-dependent capabilities positively impacted the generated outcomes they remained to be ill-defined, difficult to measure and require more than just measurements and numerical approaches (Noordegraaf and Abma, 2003; Rietjens, et al., 2011). More importantly, we found that in within the TFU and between the TFU and other systems as part of the supra-system, actors involved hold different perceptions in regards to both the existing or expected situation (characteristics, consequences, causes and possible solutions) and the desired situation or outcomes (i.e. end-states). Thus, there tends to be a difference between the perception of policy outputs and policy impacts among the many actors involved in stabilisation operations.

Accordingly, proposition 5 is supported by the case study:

Proposition 5:

The development of condition-dependent capabilities positively impact the attainment of outcomes, yet, policy impacts will be difficult to measure and actor dependent.

5.7 DISCUSSION

The case study described the chronological analysis of the conceptual model and presents the main findings regarding constructs and propositions. The main findings of the analysis are summarised in table 5.3 and 5.4.

The analysis revealed that different types of uncertainty, namely impact uncertainty (i.e. sensitive dependence on initial conditions and *equifinality*), modelling uncertainty (imprecise knowledge on how to control input), uncertainty about relations between actors, environmental uncertainty (i.e. unpredictable events and factors beyond control) and uncertainty about outcomes, that impacted the predictability of the TFU's condition, in turn influencing the multi-actor interaction during the mission.

Impact uncertainty (i.e. sensitive dependence on initial conditions and *equifinality*), modelling uncertainty (imprecise knowledge on how to control input), uncertainty about relations between actors and uncertainty about outcomes was found to be caused by two distinct factors, namely the strategic model and system diversity. Environmental uncertainty (i.e. unpredictable events and factors beyond control) was found to be caused by the operating environment.

Particularly, the ISAF mission statement and high-level policy whitepaper was perceived by most interviewees as abstract. However, when one studies stabilisation operations through the lens of complex systems thinking a general and abstract mission statement fits perfectly with the uncertainty of the environmental conditions, in turn, providing ground for an inherent order (i.e. emergent strategy) that identifies and models a system's overall behaviour through adapted and acceptable WAYS. Additionally, although the impact uncertainty and environmental uncertainty imposed a limitation on the predictability of the TFU as complex system, it has simultaneously revealed that certain ENDS may be the result of WAYS that started from different initial conditions as these differences could be amplified through positive feedback controls. Finally, system diversity (e.g. interpersonal orientation; goal orientation; time orientation) appeared to be an important factor that created friction amongst the TFU's sub-system's as well as between the TFU and various other systems as part of the supra-system.

To gain a better insight of the local context of Uruzgan Province, which, in turn, would support to the TFU's mission planning, a so-called civil-assessment of the province was conducted by the local NGO The Liaison Office (TLO) through the Dutch Embassy in Kabul and seemed a solid initiative from the Dutch to enhance their understanding over the local context. However, although this report was sent by TLO to the Dutch Embassy in July 2006 it only became available to the TFU in August 2006 when the mission had already started. Consequently, the outcomes of the civil assessment arrived too late to have an impact on the TFU's initial planning. Over time this variation in the initial condition of the TFU as complex system had huge influences on its long-term behaviour.

Table 5.3: Summary of the analysis of constructs.

CONSTRUCT	TFU	REFERENCE
Internal organisation	Impact uncertainty Modelling uncertainty Uncertainty about relations between actors Uncertainty about outcomes	Section 5.3
External environment	Environmental uncertainty	Section 5.3
A system's condition	Dynamic equilibrium: balancing between 'complicated' and 'chaotic'	Section 5.3
Required self-organising ability	Bounded instable behaviour (i.e. non-linear feedback mechanisms)	Section 5.4
Ability to differentiate	Ability of (sub-) systems to interact is caused by intentional choice (i.e. design) or determined by environmental conditions	Section 5.4
Ability to integrate	Ability of (sub-) systems to interact is caused by intentional choice (i.e. design) or determined by environmental conditions	Section 5.4
Condition-dependent capabilities	Depend on the state of 'shared awareness' amongst the actors involved and ability to reconfigure their organisational capabilities	Section 5.5
Outcomes	Dealing with 'wicked problems' Differences between outcomes and impacts Dependent on actors perspectives	Section 5.6

The TFU's self-organising ability to differentiate and integrate its organisational resources and competencies was characterised by its non-linearity. Most integration was determined by environmental demands (i.e. 'permissive' and 'non-permissive' security environment) and resulted in ordered conditions. In most instances, differentiation was the result of intentional choice (i.e. differences in organisational culture). However, differentiation was observed in situations where members of the sub-systems demonstrated instable behaviour by ignoring the security regulations determined by the TFU HQ which potentially settled the whole system in unordered and more dangerously disordered conditions.

The TFU used information processing (i.e. schemata) as the key operating process through which the *ex-ante* assessment took place. Unfortunately, information processing was hindered in both quality and quantity by the lack of a robust information strategy. As a result, no joint encrypted information and communication system was available to share information effectively, efficiently and securely amongst the TFU's sub-systems and between the TFU and the other systems as part of the supra-system. Moreover, the willingness to share information was hindered by efforts of the systems themselves and due to the classification of the information itself. Consequently, the absence of a robust information strategy, inter-operable ICT assets and inter-personal relationships between the systems involved negatively impacted the creation of a state of shared awareness, an essential pre-condition for emergent behaviour, self-organisation and the subsequent development of condition-dependent capabilities.

Table 5.4: Summary the analysis of propositions.

PROPOSITION	TFU
Proposition 1a: The uncertainty derived from the internal organisation impacts the predictability of a system's condition	Supported
Proposition 1b: The uncertainty derived from the external environment impacts the predictability of a system's condition	Supported
Proposition 2: The dynamic equilibrium of a system's condition is expected to positively impacts its required self-organising ability	Supported
Proposition 3: A system in dynamic equilibrium is expected to be mainly driven by non-linear feedback controls, thereby enabling its required self-organising ability to differentiate and integrate	Supported
Proposition 4: A system's self-organising ability to differentiate and integrate is expected to positively impacts the development of condition-dependent capabilities	Supported
Proposition 5: The development of condition-dependent capabilities impact the attainment of outcomes, yet, policy impacts will be difficult to measure and actor dependent.	Supported

However, our findings indicate that the TFU developed condition-dependent capabilities. Whereas the development of sub-system capabilities were mostly the outcome of prior shared intentions, system and supra-system capabilities, by contrast, were found to be the result of emergence from complex interactions

between the sub-systems or systems in the absence of prior shared intentions or were determined by environmental demands.

Although we argue that condition-dependent capabilities positively impact the generated outcomes, the TFU had to deal with so-called 'wicked problems' which are ill-defined and could be dealt with by applying multiple solutions. Additionally, these potential solutions, in turn, could generate new problems. Indeed, organisations that must deal with 'wicked problems' hold important management implications (Tompkins, 2005) such as dealing with ambiguous, intangible and changing goals, are experiencing difficulty with establishing performance standards and measuring results (Wilson, 1989). This applied in particular to the TFU where outputs often were unobservable and unmeasurable. As a result, strategic management tools are only applicable to a very limited extend. Indeed, although some system capabilities or even supra-system capabilities were focused on direct support to the local Afghan people it is questionable if certain outcomes could be labelled "positive outcomes" (e.g. woman's rights violations and child labour) due to the fact that the participating systems had different views of a situation and subscribed to different priorities and preferences for particular solutions. Moreover, certain outcomes were not even directly linked to the TFU mission or Afghanistan in general due to strategic motives (the G20 Summit).

Social complexity resulted in different options in regards to what was fair and just in policy making. More specifically, the many actors involved had different thoughts about the situation or problem and about how these should be formulated and solved. Differences in problem perception typically occur when there are different impressions of the existing or expected situation and the desired situation. Finally, the very fact that the TFU had to deal with 'wicked problems' resulted in a situation where the TFU HQ had no clear indications of when certain ENDS were achieved. Hence, outcomes were, even *ex-post*, not determinable at all.

Reflecting on linear thought processes, concepts such as stabilisation operations make it seem that supporting organisations such as Western IOs, NGOs and private firms have a blueprint for the stabilisation and recovery of a post-conflict zone. However, complex systems thinking tells us that that the output of the supporting organisations cannot be understood in isolation from organisations and societies such as the host nation and local actors who they support. In complex systems language we would say that we cannot explain the behaviour of the whole system by analysing its individual sub-systems. Supporting organisations, therefore, should focus their efforts on facilitating and supporting the overall stabilisation and recovery process in which the supported organisations and societies self-organise in order to enable emergent behaviour necessary to sustain peace.

In sum, differences in both problem perception and the desired outcome (i.e. ENDS) perfectly illustrate the different types of uncertainty that impacted the predictability of the TFU's condition, in turn influencing the multi-actor interaction during the mission. Particularly, impact uncertainty, modelling uncertainty, uncertainty about relations between actors, combined with environmental uncertainty resulted in uncertainty about outcomes. Most of these uncertainties only became observable once the TFU was deployed and

therefore automatically became part of a supra-system (e.g. IOs, NGOs, local actors and the private sector). As a result, we view the TFU as a complex system which was sensitive to its initial conditions and, once deployed part of a greater supra-system, of which the effectiveness of the strategic model depends primarily on its ability to respond to the changing environmental conditions. Accordingly, we propose that the strategic model of stabilisation operations need to make a shift from its focus on ENDS towards one which provides ground for an inherent order (i.e. emergent strategy) that identifies and models a system's overall behaviour through adapted and acceptable WAYS to respond effectively to changing environmental conditions. In other words, strategic modelling is inherently subject to change.

6

Case study 2: UN MINUSMA[6]

"We are in a crisis – all of us. […] have reached a turning point, a moment that will determine much of what happens next. In complexity theory, this is a very special place, when a system – whether individual or group – becomes so turbulent that it moves toward the "edge of chaos", also called the place of "far from equilibrium" conditions".

- *Sandra Bloom (2017)*

6.1 INTRODUCTION

The TFU case study presented the first analysis of the conceptual model. However, since design analysis is an iterative process it should be repeated several times in order to enable the development of the final conceptual model (Markus et al., 2002). Therefore, this second case study, the United Nations Multidimensional Integrated Stabilisation Mission in Mali (UN MINUSMA), continues the iteration process by presenting a second analysis of the conceptual model in order to further shape it as potential solution to the respected problem.

As the previous case study, this chapter relies on empirical data from the second qualitative case study discussed in chapter 4 and is organised as follows: after this introduction the case study is presented. What follows is the chronological analysis of the conceptual model: in section 5.3 we describe uncertainty and the impact on a system's condition followed by the illustration of a system's required self-organising ability in section 5.4. Section 5.5 provides an overview of a complex system uses information to self-organise the differentiation and integration of its sub-systems, organisational resources and competencies into condition-dependent capabilities. The outcomes gained from condition-dependent capabilities are described in section 5.6. We conclude with a brief discussion of the main findings of this chapter.

[6] Parts of this chapter have been appeared as the following peer reviewed published article:
Gans, B. (2018). The complexity of peacekeeping intelligence. Journal of European and American Intelligence Studies 1(1), 35-60.
Parts of this chapter have been presented at the following peer reviewed conference:
Gans, B. (2018). Understanding stabilisation operations as complex systems. Ninth International Conference on Complex Systems (ICCS), Cambridge MA, USA.

6.2 CASE STUDY

6.2.1 Historical background

After liberating most of North Mali from jihadist occupation in 2013, France set up a military mission (Operation BARKHANE) to prevent Al-Qaida affiliated terrorist groups from entrenching safe havens across the Sahel. In Mali, the presence of the UN enabled over 400.000 displaced people to return north. However, the security situation is still of concern in Northern Mali and rapidly deteriorating in Central Mali as well as in the border area between Mali, Burkina Faso and Niger. Newly emerging armed (terrorist) groups and spreading banditry, heaving links to with terrorist groups (AQ in North Mali and ISIS in Central Mali) that operate internationally. The treat of terrorist characterised by small scale operations specifically targeting security authorities with violent attacks and vulnerable groups with extremists messages as well as rudimentary socio-economic benefits for recruitment purposes in order to gain support of the local population, before scaling up operations again. Therefore UN MINUSMA's role in contributing to peace and stability in Mali is crucial.

6.2.2 Case description

Out of the great number of stabilisation operations conducted at the time of this study, we selected the United Nations Multidimensional Integrated Stabilisation Mission in Mali (UN MINUSMA) because it is one of the largest UN integrated missions in history and has a clear integrated and comprehensive character. The need for an integrated design is stressed by the Dutch government (as one of the troop contributing nations) as follows:

> "The complex and problematic situation in Mali requires an integrated and comprehensive (i.e. '3D') approach. Efforts regarding security, rule of law, good governance, socioeconomic development and the support of political processes are to be regarded as an integrated whole" (Ministry of Foreign Affairs, 2013).

A second important selection criterion was accessibility, something we will describe in more detail in the next section.

UN MINUSMA's primary mission is to contribute to a broad range of security-related tasks which aim at stabilisation and recovery throughout the country. Moreover, by unanimously adopting resolution 2164, the UNSC broadened the mission with tasks related to the protection of civilians, human rights, supporting political processes, Security Sector Reform (SSR) as well as the Rule of Law (UN, 2017).

UN MINUSMA was divided into three main sub-systems: the UN civilian staff (an estimate of 500 civilians), UN military staff (over 13,000 troops) and the UN police staff (roughly 1900 international policemen) (UN, 2017). The mission was organised as follows: the UN MINUSMA Headquarters (UN MINUSMA HQ) was situated in Bamako from where the overall command and control over the three main Sector Headquarters (SHQs) took place. SHQ-West (SHQ-W) operated from Timbuktu, SHQ-North (SHQ-N) was in Kidal and SHQ-East (SHQ-E) was situated in Gao. The different sub-systems of the mission were deployed within

these SHQs and conducted various tasks. The UN civilian staff was responsible for reconstruction efforts and maintaining contact with the host nation government, local actors as well as NGOs. The UN military staff was to maintain security in the country. It also advised and supported activities of reconstruction. The UN police staff was responsible for the mentoring and joint patrolling with the Malian police force. Additionally, and quite unique for stabilisation operations under the authority of the UN were the All Sources Information Fusion Unit (ASIFU), Special Operations Land Task Group (SOLTG) and a helicopter detachment (HELIDET) consisting of various helicopters. These sub-systems were augmented to UN MINUSMA since lessons learned from previous UN peacekeeping missions had stressed the need for the collection and dissemination of intelligence (Cammaert, 2003; Norheim-Martinsen and Ravndal 2011; Barry 2012).

UN MINUSMA, as a system, was part of the greater supra-system engaged in the stabilisation and recovery of Mali. The supra-system consisted of several other systems such as other coalition factors (i.e. the French TF BARKHANE), IOs (i.e. other UN agencies), NGOs, local actors both state and non-state as well as the private sector. Accordingly, we study UN MINUSMA as a complex system interacting with other systems as part of the greater supra-system active in northern Mali. Figure 6.1 presents an overview of UN MINUSMA, its sub-systems and part of the supra-system.

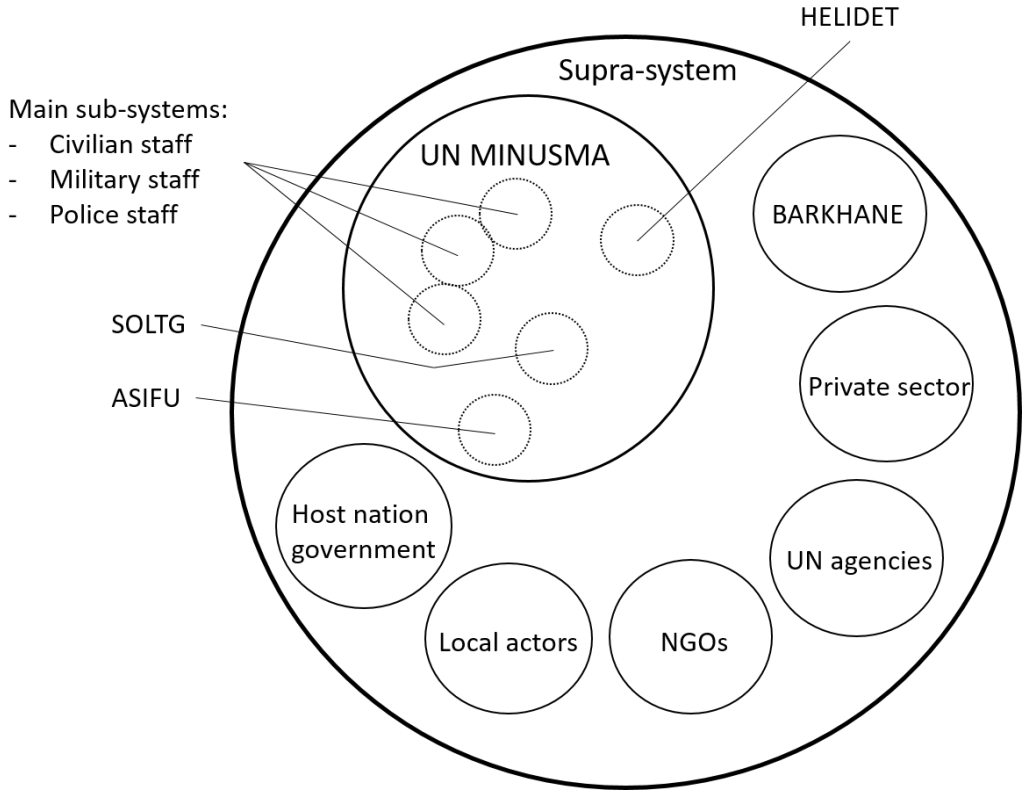


Figure 6.1: UN MINUSMA, its sub-systems and part of the supra-system.

6.3 UNCERTAINTY AND THE IMPACT ON A SYSTEM'S CONDITION

The findings from the case study enabled us to identify different types of uncertainty which impact the predictability of UN MINUSMA's condition, in turn influencing the multi-actor interaction during the mission. In this study we connect these different types of uncertainty to the literature on complexity theory and define them accordingly as impact uncertainty (i.e. sensitive dependence on initial conditions and *equifinality*), modelling uncertainty (imprecise knowledge on how to control input), uncertainty about relations between actors, environmental uncertainty (i.e. unpredictable events and factors beyond control) and uncertainty about outcomes (see figure 6.2).

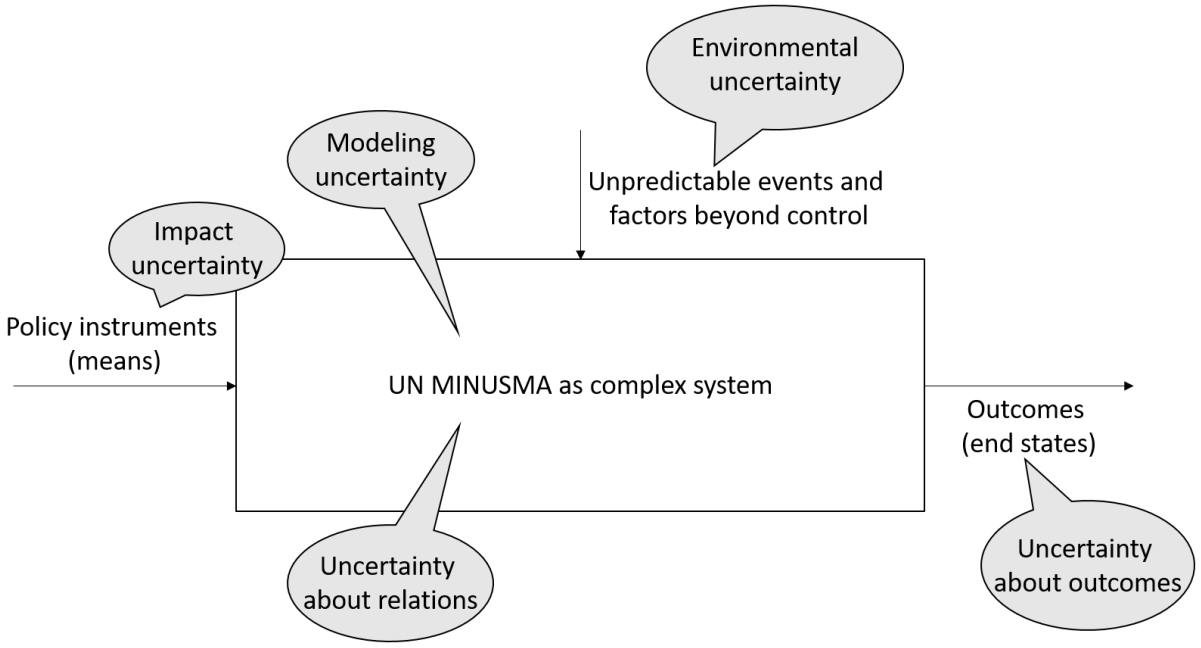


Figure 6.2: Types of uncertainty that impacted the predictability of UN MINUSMA's condition.

Impact uncertainty (i.e. sensitive dependence on initial conditions and *equifinality*), modelling uncertainty (imprecise knowledge on how to control input), uncertainty about relations between actors and uncertainty about outcomes was found to be caused by two distinct factors, namely the strategic model and system diversity. Environmental uncertainty (i.e. unpredictable events and factors beyond control) was found to be caused by the operating environment. Since we found that the factors selected influenced each other in various points in time we describe them interchangeable.

6.3.1 Strategic model

Business strategy (ENDS). At the start of UN MINUSMA in 2013 the UNSC adopted resolution 2100 which described the mission statement as follows:

> "UN MINUSMA is to support political processes in Mali and carry out a number of security-related tasks. The mission was asked to support the transitional authorities of Mali in the stabilisation of the country and implementation of the transitional roadmap" (UNSC, 2013).

During the mission, the UNSC adopted resolution 2164 which broadened the mission's mandate as follows:

> "UN MINUSMA should focus on duties, such as ensuring security, stabilisation and protection of civilians, supporting national political dialogue and reconciliation, assisting the reestablishment of State authority, rebuilding of the security sector, and the promotion and protection of human rights of that country" (UNSC, 2014).

These resolutions describe the mission's mandate which serves as the overarching strategy at the political and military strategic level. A third UNSC resolution was adopted in 2015 which then amended UN MINUSMA's mandate with goals regarding:

> "The support of the ceasefire arrangement; implementation of the Agreement on Peace and Reconciliation in Mali; Good offices and reconciliation; protection of civilians and stabilisation; promotion and protection of human rights; humanitarian assistance and projects for stabilisation; protection, safety and security of UN personnel; support for cultural preservation" (UNSC, 2015).

Apart from these resolutions, the UN has drafted the so-called 'Mali country programme document 2015 – 2019'. According to this document, the country programme "will help to accelerate progress towards achieving national objectives, particularly in terms of equitable coverage of essential social services, improvements in the governance and efficiency in each sector" (p. 4). Reflecting on the three UNSC resolutions as well as the goals defined in the 'Mali country programme document 2015 – 2019, UN MINUSMA had to deal with so-called; wicked problems' which are "problems that are ill-defined, consist several conflicting criteria for solution definition, solutions which create further problems and no obvious indications of when enough has been achieved" (Rittel and Weber, 1973, p. 155).

The UNSC resolutions as well as the 'Mali country programme document 2015 2019' served as the starting point from where further formulation of measurable objectives and performance targets at UN MINUSMA Headquarters (UN MINUSMA HQ) could take place. At UN MINUSMA HQ, the Special Representative of the Secretary-General (SRSG) and the Force Commander (FCOM) set operational goals in their quarterly guidance and which they sent to the Heads of Office (HoO) of the respective SHQs and military commanders that were under the direct command of the FCOM. The goals as defined in the quarterly guidance were by most interviewees perceived as clear and tangible. However, time orientation played an important role in goal attainment. Three indicators of time orientation were identified from the data: the uncertainty of the conditions in the environment over time, the time span of bureaucratic processes, and actors' personal time orientation in relationship to their deployment time. A CIMIC officer explains:

> "To get to the point where we are conducting a Quick Impact Project (QIP) and doing studies beforehand to see how things went before we did it and then study it six months after to find out what true impact that had on the community, positive or negative… So, in quarterly guidance too, it can change the focus area. I do for

example a QIP in a certain area because that's the focus area, then the next quarterly guidance comes out, and they shift focus, we're stuck in that region on that project because it may take upwards almost a year to get it through the whole process. This can create some issues on CIMIC engagement… [Another problem] is the fact that most UN civilian employees work with minimal a two-year contract and sometimes try to be here for three years depending on their mission. So, there's not an urgency and they can take a long slow development approach to it". (UN military staff, R11).

The impact uncertainty derived from the abstract UNSC resolutions and goals defined in the 'Mali country programme document 2015 – 2019, clearly illustrate the sensitive dependence on initial conditions of UN MINUSMA as complex system. Furthermore, the three indicators of time orientation fit perfectly with the uncertainty of the environmental conditions and illustrate the *equifinality* of open systems which allow for certain ENDS to be the result of WAYS that started from different initial conditions as these differences could be amplified through positive feedback controls.

Organisational strategy (MEANS). UN MINUSMA's multidimensional and integrated character required interaction between the sub-systems of UN MINUSMA as well as between UN MINUSMA and the other systems embedded in the supra-system (see figure 6.1). However, UN MINUSMA's organisational structure was characterised by its high level of formalisation and strong hierarchical culture with decision-making authority centralised at the FHQ. Formal and hierarchical organisations are typically finding difficulty in establishing effective collaborative process design, process management and facilitation due to their lack of flexibility and open communication (Willem and Buelens, 2007). In the case of UN MINUSMA, the formal and hierarchical organisation led to several problems with regard to its multidimensional and integrated character. An excellent example of such problems can be found in the organisational disposition of the ASIFU and the dedicated intelligence cell of the FCOM in UN MINUSMA's organisational structure. Whereas the former (consisting of more than 70 highly trained personnel) formally had to be directed by the latter (consisting of 15 personnel with little experience) friction was observed since both sub-systems believed to have ownership over the control of UN MINUSMA's intelligence activities. Another excellent example of such problems is related to the information strategy and will be discussed in the next section.

…the impact of the operating environment. To illustrate the environmental uncertainty we applied three criteria, namely the uncertainty derived from the environmental conditions, the situational awareness about the environment, and the feedback received from the environment. The security situation in the operating environment was considered an important external determinant for impacting UN MINUSMA's strategic model and specifically the organisational strategy of SHQ-N. A stabilisation and recovery officer described the security situation in SHQ-E as 'relatively stable' which resulted in a heterogeneous supra-system consisting of most systems mentioned above:

"And even if security… we are feeling a bit of a slide back over the last couple of months, but regardless of that most actors still want to come to Gao because we are here and they see things are moving forward" (UN civilian staff, R3).

By contrast, SHQ-N was characterised by a highly instable security situation in which several attacks were executed on the UN troops while patrolling the area as well as more complex attacks against the UN camps in northern Mali. The following two examples sadly illustrates this fragile security situation:

> "Friday 12 February at 7 am, MINUSMA camp in Kidal was the target of a complex attack which, according to a provisional toll, has killed three peacekeepers and wounded 30 others. My duty, on behalf of the Secretary-General, is to express our outrage over this hateful an irresponsible act occurring a week after the local arrangements between CMA and Platform, and 48 hours after my visit to Kidal. This serious act reflects the disarray of the enemies of peace since it comes at a time when the implementation of the Peace Agreement increasingly becomes a reality in Mali" (Source: adapted from SRSG for Mali, Mr. Mahamat Saleh Annadif, in UN MINUSMA press release, 2016).

> "Monday 18 April 2016 a demonstration took place this morning in Kidal. At around 10 am, demonstrators broke into the airport compound – a restricted area – ransacking and setting fire to security facilities. Kidal's airstrip is essential for supply of humanitarian aid, support for local communities, as well as operations for MINUSMA and its partners" (Source: adapted from UN MINUSMA press release, 2016).

Consequently, the HoO of SHQ-N, in close coordination with the SRSG and the Designated Official (DO) at the UN Headquarters (UNHQ), made the decision to substantially downsize the UN civilian staff in northern Mali. Moreover, the incidents resulted in a loss of key facilities such as the camp's hospital, the military operations room from a UN military unit as well as the airport itself. Consequently, SHQ-N turned out to be a comparatively small and homogenous system. According to the HoO:

> "The problem here in Kidal is that there are not many other organisations present. The UN is far from complete. Our PIO office for example has been closed for a very long time. Not many UN agencies are present here. That also applies for the NGOs. Only the International Committee of the Red Cross (ICRC) and some local NGOs are present. The private sector is only here because we brought them here. This is of course due to the poor security situation in Kidal and the debate around development vs. security". (UN civilian staff, R2).

More importantly, almost all interviewees perceived the situation in SHQ-N as severely problematic since the implementation of the strategic model and mandate required the involvement of State authority:

> "The challenge in Kidal, and it is very specific and unique, the legitimate authorities have been kicked out of the region. So, since May 2014 we have no legal counterpart, recognised by the international community. This means that the biggest part of the mandate cannot be implemented because we do not have such a counterpart". (UN civilian staff, R2).

As a result, UN MINUSMA experienced a lack of progress in improving the security and humanitarian situation throughout SHQ-N due to changes in the environmental conditions and the high uncertainty of information about the environment. Again, a perfect illustration of UN MINUSMA's sensitive dependence to its initial conditions and evidence that prediction of contemporary conflict is found to be impossible. Interestingly, although the impact uncertainty and environmental uncertainty imposed a severe limitation on the predictability of UN MINUSMA as complex system, it simultaneously revealed that certain ENDS

may be the result of WAYS that started from different initial conditions as these differences could be amplified through positive feedback controls.

Information strategy. UN MINUSMA failed to link its information strategy with its organisational strategy and business strategy. Generally, this was due to insufficient mechanisms, processes, and resources such as interoperable Information and Communications Technology (ICTs). We need to make a distinction here between internal centralised information sharing (i.e. within the individual sub-systems of UN MINUSMA), internal distributed information sharing (i.e. between the sub-systems of UN MINUSMA) and external distributed information sharing (i.e. between the sub-systems of UN MINUSMA and the other systems involved).

Internal centralised information sharing was considered by all interviewees as sufficiently institutionalised. Daily reporting through fixed reporting lines were present in all sub-systems. Most of these reports were sent to UN MINUSMA HQ and then merged into a centralised report. However, the low quality of the data connection hindered the speed of information processing (Rietjens and Baudet, 2017). When asked if these communications took place through a secured system, some UN civilian staff respondents stated that within the UN communications usually takes place through unsecure general e-mail since many UN accounts were not active and most interviewees considered MINUSMA's general information system to have no classification at all.

Internal distributed information sharing was hampered by the absence of a general information system or database with access for all the sub-systems. Moreover, some African units (e.g. Chad and Niger) hardly possessed any IT equipment, and even when they did possess ICT capabilities their heterogeneity impeded interoperability. The Dutch contingent within UN MINUSMA introduced the Theatre Independent Tactical Army and Air Force Network (TITAAN), an encrypted ICT platform for secure data communications between the Dutch Contingent Command, SOLTG, HELIDET and ASIFU. Interestingly, the Dutch granted personnel from Western (i.e. European) Nations that were part of ASIFU access (and if required training) to the system as well. Hence, secured information sharing between these sub-systems was guaranteed. By using these systems, the classification of the information being processed through these systems was labelled as "SECRET", and thus not releasable outside this secure environment.

> "The main shortcoming is that all the information systems we have are based upon NATO standards" (UN military staff, R19).

The military units that were not part of this selected community as well as the UN civilian staff and police force staff did not have access to this encrypted ICTs. According to Rietjens and Baudet (2017) this divide "was often referred to as information sharing between the "skiing countries" (i.e., European countries that enjoy skiing in their winter holidays) and the "non-skiing countries" (mostly African countries)" (p. 208). From a military perspective, classified information needs to be processed through encrypted ICTs. Consequently, the military units that did have access to such systems did not share classified information with those who were not authorised. Hence, an information asymmetry between sub-systems with and

without TITAAN was created. The absence of a joint information and communication system and database, with a certain level of encryption was by most interviewees perceived as a huge shortcoming:

> "The information exchange will probably be limited to e-mail or word documents or perhaps via SMS or whatever. There is no joint system for the civilian side that are compatible to ours. These are military only which is a huge shortcoming" (UN military staff, R13).

These finding are supported by previous research of Snabilie (2014 who found that:

> "National sharing versus international sharing is a big issue…. According to several informants, there was a relation between the fact that there were no clear and discrete levels of classification valid with the UN and the willingness to share information. Allegedly, when countries had so little control as to who would receive information and who would not, they often chose to share it only nationally or with fellow NATO member state officers in their network (p. 62).

In the absence of a joint system most information with a certain level of classification was exchanged during face to face meetings which of course hindered the speed of information processing and hence creating shared awareness. However, information processing capacity was increased in SHQ-E by organising a weekly coordination meeting between the sub-systems of UN MINUSMA and the other UN agencies present in the region (i.e. creation of lateral relations). During these meetings, representatives from the UN MINUSMA sub-systems as well as UN agencies could participate in order to communicate with each other, share information and identify opportunities for cooperation. In SHQ-E, these weekly meetings were found effective:

> "There you exchange information, there you exchange information about the areas where we [the mission] do not operate…That is actually a kind of platform for the exchange of information and there you also coordinate". (UN civilian staff, R2).

Again, due to the instable security situation in SHQ-N this meeting was not institutionalised by the HoO due to the absence of most of the actors in the region:

> "In a normal context, there is a coordination meeting between MINUSMA and the other UN agencies. This means within the UN itself. This is called UN Regional Team (RT) but is not in place in Kidal since you can't coordinate with yourself'. (UN civilian staff, R22).

In both SHQs a weekly security meeting was organised. All the UN actors who had a responsibility towards security were invited and additionally some representatives from the French TF BARKHANE were attending as well. All decisions regarding regional security were made in this meeting. Interestingly, in order to increase information processing capacity (i.e. investment in vertical information systems) a second hierarchical line of reporting was identified since the outcomes of these meetings were sent directly to the UNHQ in New York:

> "Regarding security, I am the area security coordinator. There is basically another hierarchical line which run parallel to the political line. Here I report directly to the Designated Official (DO) who reports to the Secretary

General. This means it's a very short line for decision-making. In this process, we are advised by the DSS which is the UN Department for Security and Safety." (UN civilian staff, R2).

The examples above all describe security and confidentiality issues in relation to the lack of a joint ICT system within UN MINSUMA. A second issue that hampered internal distributed information sharing is related to the organisational structure of the mission. According to Yang and Maxwell (2011) information sharing between different departments can be hindered due to differences in mandates, processes and expectations. Moreover, in bureaucratic organisations such as UN MINUSMA, authority is typically centralised at the higher levels of an organisation. As a result, (the speed of) information sharing could be impeded since decision rights are held at the top of an organisation, a characteristic which relates closely to the formal system of an organisation (Kim and Lee, 2006). A formal organisation focuses on executing daily operations as efficiently as possible in order to attain the organisation's goals. Therefore, a formal organisation operates according to clearly defined hierarchical organisational structures and processes (Gulati and Puranam, 2009). To sustain its interest of efficiency, a formal system is meant to resist change (Stacey, 1995). Formal systems experience difficulty in the sharing of information since they typically lack flexibility and an open communication culture (Willems and Buelens, 2007). Indeed, as described by Bar-Yam and Minai, 2003) hierarchical structures are found to be less efficient in conditions that are characterised by high complexity: "hierarchical command systems are designed for the largest scale impacts and thus relatively simple warfare. Indeed, traditional military forces and related command, control and planning, were designed for conventional large scale conflicts. Distributed control systems, when properly designed, can enhance the ability to meet complex challenges" (p. 1).

Another problem of the formal organisation with regard to information sharing is related to the national command and control lines. Although UN MINUSMA had a clear, supranational organizational structure, some countries did not share valuable through the official chain of command (i.e. UN MINUSMA) but did this only through their national lines (Rietjens and Baudet, 2017). As a result, UN MINUSMA HQ, the SHQs or the ASIFU did not receive the information at all.

External distributed information sharing was depending on the classification of the information. That information that could be disclosed without restrictions was released through conventional email. However, this wasn't sufficient since not all the local actors were using the internet. Alternatively, a lot of communication was either done over the phone and by text message or key actors had to allocate resources physically to counter the poor presence of ICT and to exercise and practice communications in a face to face manner which was experienced as very costly and ineffective. As a stabilisation and recovery officer puts it:

"Meetings face to face can be difficult if you are dealing with the mayor of Ansongo or Bourem. So, if you want to meet that person face to face it requires for me, for instance, a security escort obviously. So, I went to Ansongo recently and had nearly 30 – 40 people with me, three Armoured Personnel Carriers (APCs), that's one mechanized platoon, one EOD section following at the back, there was my vehicle with a driver and a 2nd

vehicle with close protection. So, when I move I move with around 40 people in order to facilitate the movement from point A to B safely. This is a huge drain on the resources, the military resources of the mission because this is just me." (UN civilian staff, R3).

Regarding the sharing of information between UN MINSUMA and NGOs, the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) was responsible for this task. UN OCHA organised weekly meetings with the NGOs that were active in the region. The goal of these meetings was to coordinate the activities of the NGOs and UN MINUSMA. During those meetings information was exchanged between different NGOs and between NGOs, UN MINUSMA and other UN agencies. This perfectly illustrates an increase in information processing capacity through the creation of lateral relations. According to a CIMIC officer:

"A NGO employee cannot access an UN-system, those are separate computers and a separate network. So, the information goes to UN OCHA, there we exchange that information with NGOs. There you exchange information about the areas where we [the mission] do not operates. That is actually a kind of platform for the exchange of information and there you also coordinate". (UN military staff, R11).

Table 6.1 shows an overview on how the information processing between the various actors took place.

Table 6.1: Information processing of UN MINUSMA. Based on Galbraith (1973): Designing Complex Organisations

Actors	Means	Organisation design strategy
UN civilian staff (internal)	General ICTs (non-encrypted) UN internal e-mail Face to face	Creation of self-contained tasks
UN police staff (internal)	General ICTs (non-encrypted) Face to face	Creation of self-contained tasks
UN military (NATO members)	Encrypted ICTs Face to face	Creation of self-contained tasks
UN military (non-NATO member)	General ICTs (non-encrypted) Face to face	Creation of lateral relations
UN military (NATO member – non-NATO member)	General ICTs (non-encrypted) Security meeting	Slack resources Creation of lateral relations
UN MINUSMA > UN agencies	General ICTs (non-encrypted) UN internal e-mail Face to face (coordination meeting)	Slack resources Creation of lateral relations
UN MINUSMA > NGOs	General ICTs (non-encrypted) Face to face (coordination meeting)	Creation of lateral relations
UN MINUSMA > local actors (state and non-state)	General ICTs (non-encrypted) Face to face	Creation of lateral relations
UN MINUSMA > private sector	General ICTs (non-encrypted) Face to face	Creation of lateral relations
UN MINUSMA > TF BARKHANE	Face to face	Creation of lateral relations

To summarise, although there was a strategic model for the mission which described most of UN MINUSMA's goals, differences in time orientation between UN MINUSMA HQ and the SHQs played an important role why most interviewees perceived this strategy and derived goals as difficult to attain. More importantly, the presence of the legitimate authorities was essential in order to actually implement the mandate. Unfortunately, in SHQ-N a unique situation was observed in which the Malian authorities were absent. Hence, the biggest part of the mandate could not be implemented in that SHQ. The related organisational strategy required interaction between UN MINUSMA, UN agencies and other actors involved (e.g. NGOs, local actors and the private sector). The instable security situation in SHQ-N resulted in the absence of many of these actors thereby forcing the personnel of UN MINUSMA to operate in isolation. For both SHQs, UN MINUSMA failed to formulate and implement an information strategy in support of the organisational strategy and business strategy. This was mainly due to insufficient mechanisms, processes, and resources. Consequently, a lot of communication between the many actors involved took place through face to face meetings. This pulled a huge drain on the already scarce organisational resources, hindered the speed of information processing and prevented the creation of a state of shared awareness within the individual systems as well as within the supra-system.

Reflecting on the above, we can point out that UN MINUSMA's strategic model perfectly fits with complex systems thinking. UN policy was translated into UN SC resolutions which presented an abstract mission statement (ENDS). Moreover, the environmental uncertainty increased the sensitive dependence on initial conditions. Interestingly, the same uncertain environmental conditions provided ground for an inherent order that identified and modelled the system's overall behaviour through adapted and acceptable WAYS. In other word, UN MINUSMA's strategic model was subject to change.

Representations of the Cynefin framework. Reflecting on the Cynefin framework we suggest that the business strategy of UN MINUSMA was balancing between the "chaotic" situation of the unordered domain and "complicated" situation of the ordered domain. On the one hand, as the business strategy and derived goals were developed at the FHQ we suggest that from their perspective it can be found in the "simple" situation because cause and effect relationships were clear. On the other hand, the differences in time orientation required further analyses of cause and effect from the staff of the SHQs, vertical coordination with the FHQ as well as horizontal coordination between the sub-systems of the respective SHQs. However, due to the absence of the legitimate authorities in SHQ-N the biggest part of the mandate could not be implemented. In other words, there was no relationship between cause and effect. Therefore, we suggest that for UN MINUSMA HQ and SHQ-N the business strategy was found in the "chaotic" situation of the unordered domain. Since this unique situation did not apply for SHQ-E we suggest that for them the business strategy was found in the "complicated" situation of the ordered domain.

SHQ-E was characterised by a heterogeneous system consisting of the sub-systems of UN MINUSMA, other UN agencies, NGOs, local actors both state and non-state as well as the private sector. As a result, SHQ-E was able to implement most of its organisational strategy, however, cause and effect relationships

of the connections required some deeper analyses. Hence, we argue that the organisational strategy of SHQ-E was found in the "complicated" situation of the ordered domain. By contrast, SHQ-N could not implement most of its organisational strategy due to the absence of many actors resulting in cause and effect relationships that were unclear. Therefore, we suggest that the organisational strategy of SHQ-N was found in the "chaotic" situation of the unordered domain.

UN MINUSMA's information strategy suggests a unique but nonetheless sad situation. While the military units which where NATO member were sharing information with each other through encrypted ICT assets most other military units, the police force staff as well as the UN civilian staff did not receive this information. Conversely, the information collected by the latter could only be communicated to the former through unsecure general ICT assets or wasn't shared at all, thereby making cause and effect relationships unclear. Consequently, both the quality and quantity of information sharing is very poor, ultimately resulting in an information asymmetry. Fortunately, the investments that were made in increasing the information processing capacity through the face to face meetings such as the coordination and security meeting proved to be an effective mechanism for countering the poor presence of interoperable ICTs. Accordingly, we suggest that UN MINSUMA's information strategy was balancing between the "complex" and "chaotic" situation of the unordered domain.

6.3.2 System Diversity

One of the characteristics of UN MINUSMA was its multidimensional and integrated character. As described in the section 6.2, the mission included over 15,000 civilian and military personnel from roughly 40 countries (UN, 2017). As a result, UN MINUSMA was characterised by its heterogeneity. Furthermore, several UN agencies (i.e. UNICEF, WFP, UNDP, UNHCR and UN OCHA), international and local NGOs, local actors both state and non-state, international military factors (i.e. the French TF BARKHANE) as well as the private sector were active in in Mali. In this study, we view all these actors as complex systems themselves with whom UN MINUSMA could potentially interact.

One of the key elements of network effectiveness is to promote shared mental models among the actors involved in order to prompt cohesion in both behaviour and interaction (Bigley and Roberts, 2001; Moynihan, 2009). This was sometimes highly challenging due to the institutional character and organisational culture of certain actors:

> "What I mentioned previously, for good collaboration first there must be the desire to collaborate and also a common idea on what you collaborate on and what you can share with each other. That is more a political decision from the organization of what we can offer and what we expect from others…". (UN civilian staff, R3).

According to Lawrence and Lorsch (1967) "sub-system members in their inter-personal relationships will be primarily concerned with either task accomplishment or with social relationships" (p. 7). According to several interviewees, the heterogeneity that characterised SHQ-E created disagreements about what to do

and who was to do it between its sub-systems. The very same difficulties between UN MINUSMA and NGO's were mentioned by almost all interviewees. A civil affairs officer explains:

> "Then there are also the NGOs who are, in some cases, very reluctant to be seen with the UN. You are talking about unity again, divergent philosophies, divergent views, because you have the humanitarian who can also sometimes be anti-military, and on the other spectrum you have the military who is very military. The interaction between the two is not always as productive as it should". (UN civilian staff, R8).

In their article, Rietjens and Baudet (2017) make similar observations:

> "With 41 countries participating in MINUSMA, it comes as no surprise that cultural differences, both national and professional, greatly affected the organization in general and information sharing in particular. These differences were rooted in different languages, beliefs, and values, different levels of training and education, and different mental models among the participating units" (p. 212).

On the other hand, the promotion of a shared mental model was displayed successfully regarding the outreach to the local population in Gao region (SHQ-E). In this instance, the Public Information Office (PIO) organised public meetings in local settings where the *chefs du quartier*, their *consiglieres*, local youth leaders, religious leaders etc. came together to drink tea and were explained about the purpose of UN MINUSMA and the meaning of its mandate. The setting was informal and ended with questions and answer sessions in which all three sub-systems of the mission could provide answers to the questions of the local population. According to a PIO officer:

> "We have a mandate but if people are unfamiliar with it they will reject it. So maybe if people perceive the mandate as good they will support it. But if they don't know what it is, who we are and what we are here for, our modus operandi, this can create tensions. Most of the time we realise that community expectations are much beyond our mandate and this is something we need to reframe every time". (UN civilian staff, R6).

According to many scholars the relationships between international interveners and local populations and promotion of 'local ownership' is key for successful peacebuilding (Richmond, 2005; Pouligny, 2006; Donais, 2012; Martin and Moser, 2012). More importantly, the local population cannot be treated as a uniformly since "residents of a host country, or a given village, do not form a homogenous community, and there is no such thing as one local viewpoint. Instead, any local population includes a multitude of political, economic, social and religious groups, which each has its own goals, beliefs, customs and attitudes. As a result, 'the local' is always highly fragmented" (Autesserre, 2014, p. 495). The importance of 'local ownership' and focus on local and micro-level dynamics was recognized and hence implemented by UN MINUSMA in SHQ-E. As a civil affairs officer puts it:

> "It's not enough to come as an expat into an area that you barely know or get to know, you must get to love it. You must to see the people, talk with them, shake hands and listen. Most of all listen. Sometimes there is just too much talking, to many people talking. Malian people don't talk, especially in the North. It will be very difficult to find out what's going on in a community, truly going on. They will tell you the tip of the iceberg but the 90% that is emerged under the water is unknown and is sometimes very difficult to acquire that information

and it's mostly due to the fact that there's no trust or they want to trust you but first they want to see what kind of a person you are. So showing that you listen more than you talk is a plus in this context and if you are able to demonstrate results with having said little it's even better. And once you start doing that you will get closer to the community, closer than others and will be willing to take you by the hand. So it's not you taking them by the hand it's them taking you by the hand and they take you where things are needed, where problems are and they will take you into discussions that concerns them deeply, closely to them. So this is a relationship you want to have". (UN civilian staff, R2).

By contrast and due to the fragile security situation, the composition of SHQ-N was very different compared to SHQ-E. It comprised of a much smaller number of troops and a very limited civilian staff and police staff element. Additionally, nearly none of the other actors operating in SHQ-E were present in Kidal. Hence, SHQ-N consisted of a more homogenous system. A HoO sums it up:

"Regarding the other actors, there are not so many. There are a few NGOs. UN agencies such as UNICEF, WFP, UNDP and WHO haven't sent any staff working in Kidal yet. The natural interlocutor of the NGOs, UN OCHA, wasn't present in Kidal for the past two years. The representative of UN OCHA only arrived two months ago here in Kidal. In the camp, we have some international companies for construction activities for example. We also sub-contract a lot of work to local private companies. The host nation government is not relevant since they are not present in the region. The only personnel from the FAMA is 100 men living in the camp near Tessalit. They do not employ any activity but are more symbolic". (UN civilian staff, R2).

The homogeneity of UN MINUSMA in SHQ-N and the absence of many actors in the region hindered the promotion of a shared mental model. Since the security situation was very fragile, one would expect that differences in organisational culture could be overcome. However, these differences remained an influential element in the interaction between UN MINUSMA and the few NGOs present. As a civil affairs officer mentioned:

"There are a few NGOs. We don't have any difficulty in interacting with them from our side. The NGOs from their point of view don't want to be next to the blue helmet which is a standard policy of them. They consider the blue helmet as the force and uniform of MINUSMA and therefore a target for potential terrorist attacks. For their own security, they don't want to be associated with the force or the uniform of MINUSMA. However, we do meet with them. Very rarely they come here to our camp to meet. That applies to those with who we run and fund some of their projects. More often we have meetings and coordinate with them outside of our camp. Outside of the camp they are willing to talk to me. Coordination meetings take therefore place in town". (UN Civilian Staff, R9).

The French military forces deployed into Mali (including SHQ-E and SHQ-N) were part of the greater French BARKHANE and were operating under a National mandate. This mandate had a complete different nature than that of UN MINUSMA since the former is a counterterrorism operation. Hence, the distinction between UN MINUSMA and BARKHANE is based on their respective tasking. Whereas the activities of BARKHANE may be viewed as a critical condition for successful peacekeeping, the clear distinction in tasking can be defined as the differentiation between conflict resolution and conflict management

(Charbonneau, 2017). In other words, BARKHANE tries to manage the situation in Mali by conducting CT activities in order to prepare the ground for UN MINUSMA and other systems in the supra-system to support conflict resolution efforts. However, as argued by many scholars, conflict management efforts (and particularly counter-terrorism) are often found to be an obstacle to conflict resolution since it eliminates pressures for resolution (Ramsbotham et al., 2005). As a result, there was neither a functional relationship nor an institutionalised structure between the two. However, information was shared between some of the military units of the UN military staff (e.g. ASIFU, SOLTG and helicopter detachment) and elements of BARKHANE in order to de-conflict their activities and create some form of shared awareness.

The purpose of interaction with the private sector (both international as local) was twofold. First, several international as well as local private firms (e.g. construction, logistics and transportation) were present on the various UN MINUSMA bases for providing construction, logistics or transportation services. In some instances, they were responsible for providing more operational related services such as deploying camera surveillance for security purposes. This was mainly done through sub-contracting by the SHQs themselves. Hence, the relationship between UN MINUSMA and these private firms was functional, since they had established a contract. The collaboration motives were instrumental since UN MINSUMA hired them for several reasons. First, they had unique resources such as the camera surveillance equipment which could be deployed quickly. Second, most local private firms their services were cheaper compared to those of international private firms or governmental agencies. The private firms, obviously collaborated with the UN MINUSMA to make profit. A second purpose of the interaction between UN MINUSMA and the private sector was the implementation of a so-called Quick Impact Project (QIP). A QIP generally is a short-term project that should be implemented within three months and have a maximum of $ 50,000 per project. Once they are implemented, these projects should have an immediate impact within the local community. UN MINSUSMA has only a facilitating role in this process which highlights the importance of local ownership. A stabilisation and recovery officer explains:

> "When we do QIPs we are in touch with the private sector but then our main role is to facilitate the liaison between the beneficiaries who own the QIP and the stakeholders who are going to conduct the execution. The contract is between the two. So, for example a local NGO owns the project and the company who realises it. Maybe a construction company or an IT satellite phone, all depending on the project. The vendor is the one under contract and the association or group that is benefiting from the project. So theoretically the QIP should come from the community to MINUSMA, then evaluated and approved by MINUSMA, sponsored by a section and the sponsoring section facilitates the liaison with the group who initiated the project and the vendor who is going to realize it". (UN Civilian Staff, R3).

In sum, differences in organisational culture was an important source for friction within the sub-systems of UN MINUSMA and between UN MINUSMA and other systems active in the region. We found that whilst in some instances these differences were solved through extensive investments in inter-personal relationships, there were some other situations in which the *raison d'être* of particularly NGO's hindered coordination and communication efforts between them and UN MINUSMA. The unique situation in SHQ-

N where the host nation government (i.e. the legitimate authorities) were absent lead to the failure to implement the biggest part of the mandate. The interaction between UN MINUSMA and the private sector was perceived as smooth. This was mainly due to the instrumental character of this interaction. Finally, political constraints due to differences in mandate (i.e. UN MINUSMA and BARKHANE) prevented any form of interaction except the informal exchange of information and de-confliction between mostly Western military units as part of UN MINUSMA and BARKHANE. Therefore, we suggest that the diversity amongst the various sub-systems of UN MINUSMA and between the mission and the other systems involved are scattered over the three domains of the Cynefin framework. Figure 6.3 provides an overview of the analyses of the unpredictability of UN MINUSMA's condition as complex system while applying the framework.

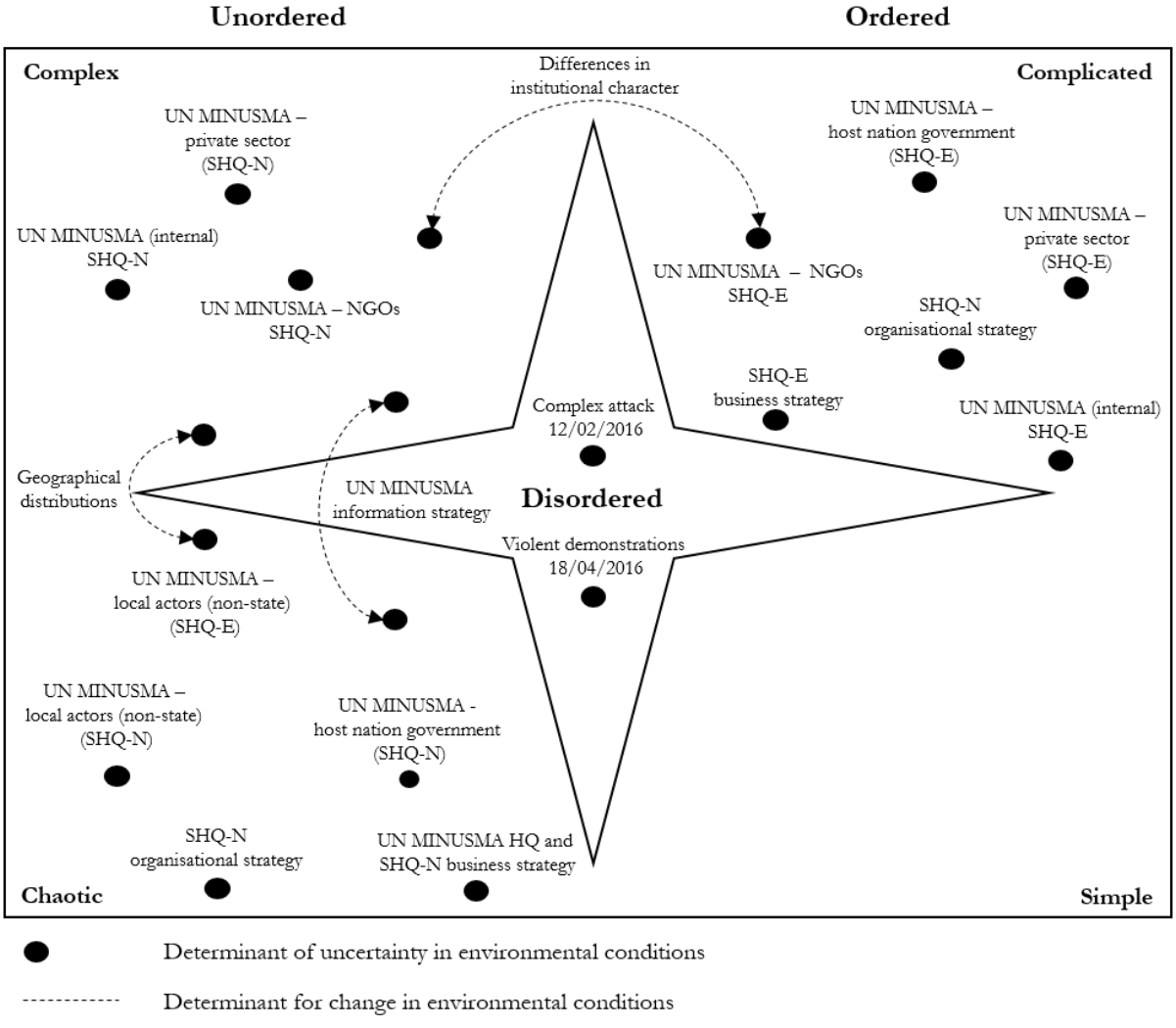


Figure 6.3: The predictability of UN MINUSMA's condition as complex system applied to the Cynefin framework.

To summarise, UN MINUSMA can be understood as complex system that is heavily impacted by different types of uncertainty derived from its internal organisation as well as the external environment. The impact

uncertainty (i.e. sensitive dependence on initial conditions and *equifinality*), modelling uncertainty (imprecise knowledge on how to control input), uncertainty about relations between actors, environmental uncertainty (i.e. unpredictable events and factors beyond control) and uncertainty about outcomes can be divided in two dimensions, namely complexity and change. Internal and external complexity relates to a number of issues to which UN MINUSMA had to attend and the degree to which they were interconnected. Internal and external change relates to the degree of discontinues change that occurred within the UN MINUSMA. Furthermore, internal and external uncertainty can be categorised in four distinct domains (Duncan, 1972). Figure 3.3 illustrates the four dimensions and corresponding levels of internal and external uncertainty. Hence, we conclude that the complexity and discontinuous change that characterised the strategic model and system diversity of the TFU as well as the operating environment resulted in a high level of both internal and external uncertainty.

Accordingly, proposition 1a and 1b are supported by the case study:

Proposition 1a:
The uncertainty derived from the internal organisation impacts the predictability of a system's condition.

Proposition 1b:
The uncertainty derived from the external environment impacts the predictability of a system's condition.

6.4 SELF-ORGANISATION THROUGH DIFFERENTIATION AND INTEGRATION

In this section, we will present the findings regarding UN MINUSMA's self-organising ability to differentiate and integrate its sub-systems, organisational resources and competencies, and with those of other systems as part of the supra-system through the *ex-ante* assessment of the enabling conditions. Representations will be presented by using the Cynefin framework.

6.4.1 "Simple" situation

As we have proposed in chapter 3 we would expect that systems that find themselves in the ordered situation of "simple" are mainly driven by negative feedback controls within both the formal and informal organisation. As a result, a single system is expected to be integrated (i.e. strong centralised) while the supra-system will be differentiated (i.e. weak distributed). Additionally, since cause and effect relationships are "clear" (i.e. low uncertainty) the volume of information which needs to be distributed is low. Hence, the organisation design strategy is characterised by rules and programs, hierarchical referral and goal setting. According to the findings presented in the previous section, UN MINUSMA did not find itself in the ordered domain of "simple". The reasoning for this is twofold. First, UN MINUSMA failed to design and implement an information strategy that supported their organisational and business strategy. As a result, information processing was hindered by a lack of interoperable ICT assets, insufficient mechanisms and

processes. Therefore, UN MINUSMA had to deal with an information asymmetry amongst its own sub-systems and in their relationship with other systems involved. Second, the incidents that took place in SHQ-N prevented UN MINUSMA to completely understand the cause and effect relationships throughout the rest of Mali (i.e. SHQ-W and SHQ-E).

6.4.2 "Complicated" situation

In the situation of "complicated" we proposed to find systems whose formal organisation is mainly driven by negative feedback controls while their informal organisation is expected to be potentially driven by positive feedback controls. Hence, we expected to find a single system to be integrated (i.e. strong centralised) as well as connections with other systems (i.e. strong distributed). In addition, we expect that more information needs to be distributed since cause and effect relationships are "complicated", which means that with sufficient time, information and resources, actors should be able to understand these relationships and use them to forecast. Therefore, we expect to find an increase in information processing capacity through the investment in vertical information systems (i.e. strong centralised) and through the creation of lateral relationships (i.e. strong distributed). These expectations are partly supported by the case study. The following examples are used to illustrate the application of these non-linear feedback controls within these interactions and their subsequent impact on the enabling conditions for differentiation and integration.

Differentiation through self-interest. On the one hand, UN civilian staff and UN military staff interacted with each other by attending joint meetings, conduct joint training, and conducted joint patrols, that is, they were compatible and there was an integration effort. On the other hand, situations were observed where the informal organisation was driven by negative feedback controls based upon the instrumental motive of self-interest. Consequently, a lack of integration effort resulted in the differentiation of the sub-systems of UN MINUSMA. A CIMIC officer explains:

> "So most of these UN civilian staff each have their personal mandate, instructions of how they supposed to do things. This means they get focused on what they're working on and they don't want anyone else interrupt them with working on this. They simply want to do a project or go to a certain area themselves, they don't want another civilian agency to go with them, and they don't want any military personnel. They just want us to provide security and they want us to show them where to go and then they want to conduct the mission because that's where they're going to be paid for, they want to show results and if they share that they lose some control over it, have to share the results with someone else, so it makes it difficult for these agencies to share". (UN military staff, R13).

Integration through a sense of urgency. We observed an interesting situation between different units of the UN military staff in SHQ-E. We have shown in section 6.4.1 that information processing between Western (NATO) units and African units was hindered by a lack of interoperable ICT assets. Thus, the two were incompatible. However, information was exchanged during face to face meetings and hence there was an integration effort. The same situation was observed in terms of joint tactical operations: the logistical

convoys that used the Main Supply Route (MSR) between Ansongo and Gao to provide logistical support to UN MINUSMA and local population were targeted by unknown groups through the use of Improvised Explosive Devices (IED) and mines. In order to provide additional security to the logistical convoys, combined patrols between a conventional UN military unit and the SOLTG were planned and thus were determined by environmental demands. The same problem as observed in terms of information processing was identified in this specific situation: the SOLTG used NATO encrypted tactical communication equipment that could not be shared with the conventional unit as they lacked NATO membership. And even more importantly did not have the required material. Since the ability to communicate between the two military units was an essential pre-condition for safely and effectively conducting these combined patrols, rigorous adjustments before integration could take place were needed. Accordingly, the two units were from a formal organisation's perspective considered incompatible due to its focus on rules and procedures. However, the units involved considered the combined patrols as highly important. Therefore, rigorous adjustments were made in order to overcome incompatibility through strong integration efforts. In other words, compatibility was positively impacted by integration effort.

Differentiation through technology. Another situation of incompatibility observed occurred between a conventional UN military unit and the HELIDET. Whereas in the former situation incompatibility was overcome through strong integration efforts, making rigorous adjustments between the conventional UN military unit and the HELIDET was considered infeasible and undesirable. This was mainly due to a lack of interoperable ICT assets and communication procedures between the two sub-systems and their competencies which are essential in deconflicting observations made by the UN military unit and the HELIDET, let alone deconflicting situations where the HELIDET was to support the ground factors with more kinetic actions.

Integration through relational mechanisms. Similar results regarding the integration of two or more systems was found. A PIO officer mentioned a very specific example in which compatibility and integration effort between UN MINUSMA and the local population was displayed:

> "We organise football matches and theatre to bring the local community and MINUSMA closer to each other. Last year we had the force commander standing in a stadium filled with 60.000 people and he was the goalkeeper. And of course, we don't want the locals play against the peacekeepers. No, we mix the teams. We offer the opportunity to get to know each other, play together and have the match" (UN civilian staff, R7).

Differentiation through duplication of effort. However, the data further revealed that the sub-systems that were found in the "complicated" situation were dealing with strong formal organisations that focused on strong centralised connections. In fact, the formal organisation overshadowed the informal organisation which is expected to focus on some form of integration between two or more systems (strong distributed). Thus, the systems were mainly driven by negative feedback controls. This disequilibrium between the two types of organisations resulted in a lack of integration effort and hence incompatibility due to rational choice. More importantly, it led to situations where two sub-systems focused their efforts on the same task which

is known as a differentiation error (Lawrence and Lorsch, 1967). A stabilisation and recovery officer sums it up:

> "Coordination is needed between several competing agencies and NGOs. There have been some cases where the same project was undertaken by different NGOs or different agencies. That situation could have been easily mitigated when it had been properly coordinated and discussed either at the PRC level to oversee that duplication of effort. It took an intervention on my part to mitigate that to make sure it became quality control, it was no quality assurance but quality control where that other agency would limit itself to certain activities and I would comprehend with the rest. It caused duplication of effort, it caused time wasted and it caused money wasted as well". (UN civilian staff, R4).

Interactions that take place in the "complicated" domain requires strong centralised and strong distributed connections. We expected to find that strong distributed connections would result in a single system to be integrated. Additionally, systems driven by positive feedback controls, were expected to positively impact both the compatibility and integration effort of systems to interact and hence would integrate with each other. Moreover, both sub-systems and systems in the "complicated" situation were indeed compatible. However, regarding the integration effort an important distinction has to be made whether the integration effort is based on rational choice or determined by the environment. Whereas the former (driven by negative feedback controls) is more likely to differentiate and the latter (driven by positive feedback controls) is more likely to integrate.

6.4.3 "Complex" situation

In the "complex" situation of the unordered domain we expect to find systems that are mainly driven by positive feedback controls characterised by increased levels of interaction and communication between two or more systems (i.e. weak centralised and strong distributed). Moreover, large amounts of information need to be processed to deal with the high uncertainty by which the "complex" situation is characterised. Thus, we expect to find an increase in information processing capacity through the creation of lateral relations (i.e. strong distributed). Again, these expectations are only partly supported by the case study. We found that UN MINUSMA was characterised by various interactions that were found in the "complex" situation of the unordered domain. The following examples are used to illustrate the application of these non-linear feedback controls within these interactions and their subsequent impact on the enabling conditions for differentiation and integration.

Differentiation due to geographical distribution. A form of interaction that was found in the "complex" situation was that between UN MINUSMA and the local population. The interaction clearly illustrates the non-proportionality of the cause and effect relationship. The example presented above (i.e. the football match) indicated strong distributed connections and thus the creation of lateral relations between UN MINUSMA and the local population. However, this form of integration, as well as the *thé de la grains*, which were focused on increasing information processing capacity took place in the Gao area which is one of the

bigger cities in SHQ-E. Unfortunately, several interviewees stressed that this form of integration was not representative to the rest of the SHQ. According to a stabilisation and recovery officer:

> "It is geographical distribution, so the whole idea is to go to areas where we haven't been before. The problem here is that we are all here in Gao. If we for example want to create more stability in another area far from here the problem is to get there. Mali is a big country. And we are still very weak at doing. So, we tend to stick very close to paved roads. We stay very close to known trails and villages, nearby areas and villages. In an area, such as Gao we are barely covering 25% of the whole region. This means there is a good 75% in which we are physically not present and/or not able to patrol on a regular basis and/or are not able to develop projects that would bring a bit of stability in the area. However, if we want to operate more outside the Gao circle means we need to receive the equal amount of security escorts". (UN civilian staff, R3).

Complexity through institutional character. The empirical data shows that the connection between UN MINUSMA and the NGOs had a strong non-linear character. This is mainly due to the strong informal organisations (i.e. institutional character) of the NGOs. In some instances, the positive feedback controls guided the informal organisation to relatively strong distributed connections and hence integration:

> "We need to show unity in our approach and the level of cooperation, but also complementarity with UN OCHA and all the humanitarian organisations for who UN OCHA is overarching have been initially extremely reluctant in dealing with MINUSMA. It is now less so the case. Almost every week now I receive phone calls from OCHA about NGOs who come to Gao" (UN civilian staff, R1).

Moreover, in the absence of UN OCHA in SHQ-N, the UN civilian staff took upon their task of coordinating with the few NGOs present in the region:

> "Civil Affairs are interacting with the NGO's. They do this primarily due to the absence of UN OCHA". (UN civilian staff, R10).

In some other occasions the negative feedback controls were observed more dominantly thereby strengthening the factors of differentiation and hence incompatibility:

> "The NGO's from their point of view don't want to be next to the blue helmet which is a standard policy of them. They consider the blue helmet as the force and uniform of MINUSMA and therefore a target for potential terrorist attacks. For their own security, they don't want to be associated with the force or the uniform of MINUSMA". (UN civilian staff, R2).

We expected to find strong distributed connections in the "complex" situations which were the result of the non-proportionality of cause and effect. Compatibility was not found in the case between UN MINUSMA and the local population throughout wider northern Mali. This was mainly due to a lack of resources (i.e. security factors) and organisational strategy (i.e. geographical distribution of UN sub-systems). Fortunately, an interesting observation can be made from the data. In the cases of the joint patrols and the connection between UN MINUSMA and the NGOs we found that integration effort positively impacted the compatibility of the sub-systems and systems to integrate.

6.4.4 "Chaotic" situation

For systems who find themselves in the "chaotic" situation the Cynefin framework argues for both weak centralised and distributed connections. Accordingly, in these situations systems should focus on establishing order through a top-down approach with no time for investigation or asking for input. As a result, the management structure is strong centralised with weak or non-existent distributed connections between the sub-systems, without any form of connection feasible. Thus, the various systems are expected to be in isolation. In order to deal with the high-level uncertainty (i.e. unclear cause and effect relationships) we expect to find systems that focus either on the reduction of information processing needs or on an increase in information processing capacity. These expectations are supported by our findings.

The fragile security situation in SHQ-N resulted in the absence of many actors (e.g. host nation government, UN civilian staff, UN agencies and NGOs). In effect, leading to the inability of SHQ-N to effectively implement the coherent and continuous comprehensive strategy. In other words, SHQ-N could not conduct the *ex-ante* assessment of the enabling factors due to the absence of many. Integration was therefore not feasible nor desirable as perfectly explained by a HoO:

> "In order to have a collaborative network, other actors need be present. Therefore, I conclude there is no unity of effort. This is of course due to the poor security situation in Kidal and the debate of development vs. security". (UN civilian staff, R2).

6.4.5 Disordered domain

The systems that are facing the disordered domain are expected to remain the *status quo* until they are pushed into one of the other domains by self-organisation or management efforts. Two events that took place in SHQ-N lead them temporarily into the disordered domain: first, the complex attack on the UN camp in Kidal. Second, the violent demonstrations and looting of the Kidal airfield, resulting in the loss of key facilities such as the camp's hospital, the operations room from a UN military unit as well as the airport itself.

Table 6.2 provides an overview of UN MINUSMA's self-organising ability to differentiate and integrate its resources through the ex-ante assessment of the enabling conditions. Representations are presented by using the Cynefin framework.

Table 6.2: UN MINUSMA and the factors of integration and differentiation.

Situation according to Cynefin	Expectations	Findings
"Simple"	Single system to be integrated	Not supported (lack of data)
	Supra-system to be differentiated	Not supported (lack of data)
"Complicated"	Single system to be integrated	Compatibility supported by data Integration effort partly supported by data*
	Supra-system slightly integrated	Compatibility supported by data

		Integration effort partly supported by data* * distinction between intentional choice and determined by the environment)
"Complex"	Supra-system to be integrated	Not supported * Additional finding: integration effort positively impacts compatibility
"Chaotic"	Single system weakly integrated	Supported
	Supra-system differentiated	Supported
"Disordered"	*Status quo*	Supported

In line with our expectations, we observed that UN MINUSMA should be understood as a complex open systems composed of multiple sub-systems that interact in a non-linear fashion, in turn impacting its condition from inside the system's boundary. Furthermore, UN MINUSMA was exposed to a highly complex, dynamic and uncertain environment from which it could not be isolated, thus impacting its condition from outside the system's boundary. As a result, UN MINUSMA demonstrated bounded instable behaviour (i.e. non-linear feedback mechanism) resulting in the dynamic equilibrium of its condition. This behaviour is partly the outcome of rational choice or determined by environmental demands.

Accordingly, proposition 2 is supported by the case study:

Proposition 2:
The dynamic equilibrium of a system's condition is expected to positively impact its required self-organising ability.

Integration occurs when either the feasibility or desirability, or both, of the ability of sub-systems or systems to interact is positive. By contrast, differentiation occurs when the *ex-ante* assessment of the ability of sub-systems or systems to interact is negative. In other words, sub-systems require several modifications in order to allow for interaction.

Therefore, proposition 3 is supported by the case study:

Proposition 3:
A system in dynamic equilibrium is expected to be mainly driven by non-linear feedback controls, thereby enabling its required self-organising ability to differentiate or integrate.

6.5 CONDITION-DEPENDENT CAPABILITIES

Self-organisation (i.e. differentiation and integration) is the result of the *ex-ante* assessment of the enabling conditions. Ideally, the systems involved share information which subsequently leads to a state of shared awareness amongst the supra-system and then provides ground for the identifying threats and opportunities, and identifying potential resource compatibility. Being responsive to the outcomes of the ex-ante assessment relates to the planning of potential activities to the situation observed (i.e. needs, threats and opportunities) including those from an integrated or differentiated perspective. A stabilisation and recovery officer sums it up:

> "So, my role is to identify areas of concern, areas of weakness or areas that have some potential but need to be strengthened and capacities need to be developed. So, when you go into a community the first thing you do is to assess what is the next step, the most suitable element to come into that area in order to develop projects which help to create stability in one of the five areas which I have mentioned. Then you try to identify the best partner whether one of our substantive programs within MINUSMA, or the G9 or UNPOL or through UN OCHA. The bottom line is who is the best partner to go into that area and do the work. What I have tried to do is create a bit of a buffet of who would be the best partner, being the civilian, military or the police, whether being civilian UN or civilian NGO and is it an international NGO or is it a local NGO? When I pick a partner, I do this with the reason to best meet the objective, or one of the five objectives". (UN civilian staff, R3).

Unfortunately, as we have illustrated in section 6.4.1 UN MINUSMA failed in creating a state of shared awareness due the absence of their information strategy. However, as presented in the previous section, depending on the condition in which the system was found (i.e. simple, complicated, complex, chaotic or disordered), it possessed the self-organising ability to differentiate and integrate its sub-systems, organisational resources and competencies. As a result, sub-system capabilities were formed through the relationships between the organisational resources and competencies from an individual subsystem (i.e. daily activities from the civilian staff, military staff or police force staff in isolation). Additionally, system capabilities were formed through the integration of the organisational resources and competencies from two or more sub-systems in a relationship. Finally, supra-system capabilities were formed through the integration of the organisational resources and competencies of two or more systems. A Dutch diplomat attached to the UN military staff provided an example of the integration between the organisational resources and competencies of the UN military staff (i.e. CIMIC) and organisational resources (i.e. funding) of the Ministry of Foreign Affairs of the Netherlands:

> "I worked with the Dutch Civil-Military Interaction (CMI) section of the ISR-coy and the civil advisor of the HOO. Some governments bring their own funding sometimes. The Netherlands brought the Dutch Stability Initiative (DSI) funds which belongs to the Ministry of Foreign Affairs. These are small projects under € 5,000 per piece. So, I talked to the Dutch and asked them if they would support any potential project that we identify. A QIP can take 9 months to a year while DSI can be done in a month. It was decided we could use this tool as well". (UN military staff, R15).

Moreover, we found that supra-system capabilities can be tangible (i.e. physical resources and competencies) as well as intangible (i.e. processes) as a stabilisation and recovery officer explained:

> "We are here to help but we are mostly here to support because it's not only a stabilization mission but also an integrated mission. I will quote our new SRSG now: the need to support them is important but proportionally they need to demonstrate what they are willing to do for themselves. The discussion is not only: we are here and have this big logistical machine, we've got a fair amount of money and they think we can move mountains overnight. Therefore, we need to work as consultants to them, we have to work in a consultative manner where everything is done through a committee and we want them to steer that committee". (UN civilian staff, R4).

Accordingly, proposition 4 is supported by the data.

Proposition 4:
System's self-organising ability to differentiate and integrate positively impacts the development of condition-dependent capabilities.

6.6 OUTCOMES

We argue that condition-dependent capabilities positively impact the generated outcomes, yet both outcomes and impacts will be ill-defined, difficult to measure and require more than just measurements and numerical approaches. This expectation is supported by the case study. On the one hand, several interviewees indicated that a great number of projects funded through the three mechanism (i.e. QIPs, trust fund and peacebuilding fund) were initiated without analysing the situation *ex-ante*. Therefore, the interviewees perceived it as difficult to interpret the situation after the project was completed due to a lack of context. As a CIMIC officer puts it:

> "The problem, however, is that CIMIC is a nice to have for the factors. There's no general appreciation because CIMIC isn't easily measurable especially in these types of environments. I don't have the resources and the factors don't have the knowledge, this is about the training piece of it, to get to the point where we are conducting a QIP and doing studies beforehand to see how things went before we did it and then study it six months after to find out what true impact that had on the community, positive or negative". (UN military staff, R11).

On the other hand, the findings from the case study present several outcomes that could be considered as clear and tangible. The following quote from one of the interviewees is used to illustrate our considerations:

> "If you think about Ansongo, you have a hospital and only last year we gave them a generator so now the hospital runs 24/7 and they can conduct surgery. This means people don't have to come to Gao which is good because in case of an emergency it will take 1 hour + to get here. This week in Gao we have the start of a new project which is solar power streetlight. MINUSMA financed 75 solar panels. We also have projects for handicapped people. Currently we are supporting Gao local radio with a decent transmitter. We also improved the prison here in Gao in order to support the living conditions there. (UN civilian staff, R6).

In sum, the UN MINUSMA mission is inherently complex and as a result no fixed standards that provide a roadmap of how to achieve the intended objectives and end-states were available. Thus, although we argue that condition-dependent capabilities positively impact the generated outcomes and impacts will be ill-defined, difficult to measure and require more than just measurements and numerical approaches. More importantly, we found that in UN MINUSMA the actors involved hold different perceptions in regards to both the existing or expected situation (characteristics, consequences, causes and possible solutions) and the desired situation or outcomes (i.e. ENDS). Thus, there tends to be a difference between the perception of policy outputs and policy impacts among the many actors involved in Mali. Interestingly, in SHQ-N the legitimate authorities were absent and hence the mandate could not be implemented there. This resulted in a unique situation where the host nation government was unable to play an active role in policy making and hence was unable to observe the policy outputs impacts in a great part of their country.

Finally, strategic motives for participating in the mission were found to be an important element at the political level. From the Dutch perspective it appeared that there were strategic motives for participating in the UN MINUMSA mission that were not directly linked to the mission or Mali in general. This was observable in public debate when several political leaders indicated that the Dutch participated in the UN MINUSMA mission due to Dutch ambition for a non-permanent seat at the UN Security Council (Kuijpers, 2016). From the perspective of the Dutch government, thus, being elected for a one-year term in the UN SC because of their role in UN MINUSMA was a positive outcome.

Accordingly, proposition 5 is supported by the case study:

Proposition 5:

The development of condition-dependent capabilities positively impact the attainment of outcomes, yet, policy impacts will be difficult to measure and actor dependent.

6.7 DISCUSSION

This case study follows the chronological analysis of the conceptual model and presents the main findings regarding constructs and propositions. The analysis is summarised in table 6.3 and 6.4.

The analysis revealed that different types of uncertainty, namely impact uncertainty (i.e. sensitive dependence on initial conditions and *equifinality*), modelling uncertainty (imprecise knowledge on how to control input), uncertainty about relations between actors, environmental uncertainty (i.e. unpredictable events and factors beyond control) and uncertainty about outcomes impact the predictability of a system's condition, in turn influencing the multi-actor interaction during stabilisation operations. Impact uncertainty, modelling uncertainty, uncertainty about relations between actors and uncertainty about outcomes was found to be caused by two distinct factors, namely the strategic model and system diversity. Environmental uncertainty was found to be caused by the operating environment.

The extent of the predictability of a system's condition can be explained through the level of understanding of the cause and effect relationships of the respective factors. Applying the Cynefin framework to the findings of the case study turned out to be a useful tool to better understand and frame the non-linear interactions. In short, the better the cause and effect relationship of a certain force is understood, the more likely the system settles into the ordered conditions. Conversely, a system characterised by factors with an unclear cause and effect relationship will more likely settle into the unordered conditions.

Table 6.3: Analysis of constructs.

CONSTRUCT	UN MINSUMA	REFERENCE
Internal organisation	Impact uncertainty Modelling uncertainty Uncertainty about relations between actors Uncertainty about outcomes	Section 6.3
External environment	Environmental uncertainty	Section 6.3
A system's condition	Dynamic equilibrium: balancing between 'complicated' and 'disorder'	Section 6.3
Required self-organising ability	Bounded instable behaviour (i.e. non-linear feedback mechanisms)	Section 6.4
Ability to differentiate	Ability of (sub-) systems to interact is caused by intentional choice (i.e. design) or determined by environmental conditions	Section 6.4
Ability to integrate	Ability of (sub-) systems to interact is caused by intentional choice (i.e. design) or determined by environmental conditions	Section 6.4
Condition-dependent capabilities	Depend on the state of 'shared awareness' amongst the actors involved and ability to reconfigure their organisational capabilities	Section 6.5
Outcomes	Differences in 'wicked problems' Differences between outcomes and impacts Dependent on actors perspectives	Section 6.5

The linkages between a system's condition and the self-organising ability of a system are more ambiguous than expected. Whereas in most situations the relationship between two or more systems was found feasible, resource scarcity appeared to be an important source for incompatibility in others. Integration effort had a more pragmatic character. In other words, integration effort was depending on the predictability of UN MINUSMA's condition. Our findings indicate that an important distinction has to be made whether integration effort is based upon intentional choice (i.e. design) or determined by environmental demands (in this case the fragile security situation). Whereby the former (driven by negative feedback controls) is more likely to differentiate. Conversely, the latter (driven by positive feedback controls) is more likely to integrate. Interestingly, integration effort was found to positively impact the compatibility of sub-systems to integrate.

The case study indicates that information processing is the key operating process through which the *ex-ante* assessment takes place and hence self-organisation occurs. Although it may seem logical and expected that the various systems share information with each other, two factors for failure were identified. First, UN MINUSMA lacked any form of information strategy in support of their organisational strategy and business

strategy. As a result, information could simply not be shared in an effective and secure manner. Second, the desirability of actors to share information combined with the classification of the information are important determinants for the *ex-ante* assessment. Ideally, the systems involved share information to create a common understanding which subsequently leads to emergent behaviour and ultimately condition-dependent capabilities.

Table 6.4: Analysis of propositions.

PROPOSITION	UN MINSUMA
Proposition 1a: The uncertainty derived from the internal organisation impacts the predictability of a system's condition	Supported
Proposition 1b: The uncertainty derived from the external environment impacts the predictability of a system's condition	Supported
Proposition 2: The dynamic equilibrium of a system's condition is expected to positively impacts its required self-organising ability	Supported
Proposition 3: A system in dynamic equilibrium is expected to be mainly driven by non-linear feedback controls, thereby enabling its required self-organising ability to differentiate and integrate	Supported
Proposition 4: A system's self-organising ability to differentiate and integrate is expected to positively impacts the development of condition-dependent capabilities	Supported
Proposition 5: The development of condition-dependent capabilities impact the attainment of outcomes, yet, policy impacts will be difficult to measure and actor dependent.	Supported

Although we argue that condition-dependent capabilities positively impact the generated outcomes, UN MINUSMA had to deal with so-called 'wicked problems' which are ill-defined and could be dealt with by applying multiple solutions. Additionally, these potential solutions, in turn, could generate new problems. Indeed, organisations that must deal with 'wicked problems' hold important management implications (Tompkins, 2005) such as dealing with ambiguous, intangible and changing goals, are experiencing difficulty with establishing performance standards and measuring results (Wilson, 1989). This applied in particular to Mali where outputs often were unobservable and unmeasurable. As a result, strategic management tools are only applicable to a very limited extend. Indeed, although some system capabilities or even supra-system capabilities were focused on direct support to the local Malian people it is questionable if certain outcomes could be labelled "positive outcomes" due to the fact that the participating systems as part of the supra-system had different views of a situation and subscribed to different priorities and preferences for particular solutions. Moreover, certain outcomes were not even directly linked to the UN MINUSMA mission or Mali in general due to strategic motives (the non-permanent seat in the SC).

Social complexity and the poor security situation lead to a small homogenous supra-system excluding the legitimate authorities who were absent. Finally, the very fact that UN MINUSMA had to deal with 'wicked

problems' resulted in a situation where the FHQ had no clear indications of when certain ENDS were achieved. Hence, outcomes were, even ex-post, not determinable at all.

Reflecting on linear thought processes, concepts such as stabilisation operations make it seem that supporting organisations such as Western IOs, NGOs and private firms have a blueprint for the stabilisation and recovery of a post-conflict zone. However, complex systems thinking tells us that that the output of the supporting organisations cannot be understood in isolation from organisations and societies such as the host nation and local actors whom they support. In complex systems language we would say that we cannot explain the behaviour of the whole system by analysing its individual sub-systems. Supporting organisations, therefore, should focus their efforts on facilitating and supporting the overall stabilisation and recovery process in which the supported organisations and societies self-organise in order to enable emergent behaviour necessary to sustain peace. The importance of this is perfectly illustrated by the fact that in SHQ-N, the legitimate authorities were absent and hence several parts of the mandate could not be implemented.

In sum, differences in both problem perception and perception of the expected situation (i.e. ENDS) illustrate the different types of uncertainty that impacted the predictability of UN MINUMA's condition, in turn influencing the multi-actor interaction during the mission. Particularly, impact uncertainty, modelling uncertainty, uncertainty about relations between actors, combined with environmental uncertainty resulted in uncertainty about outcomes. Most of these uncertainties only became observable once UN MINUSMA was deployed and therefore automatically became part of a supra-system (e.g. other IOs, NGOs, local actors both state and non-state as well as the private sector). As a result, we view the TFU as a complex system which was sensitive to its initial conditions and, once deployed part of a greater supra-system, of which the effectiveness of the strategic model depends primarily on its ability to respond to the changing environmental conditions. Accordingly, we propose that the strategic model of stabilisation operations need to make a shift from its focus on ENDS towards one which provides ground for an inherent order that identifies and models a system's overall behaviour through adapted and acceptable WAYS to respond effectively to changing environmental conditions. In other words, strategic modelling is inherently subject to change.

7

Cross-case analysis

"Our commonality gives us power to create a harmonious garden, our uniqueness gives us power to decorate each garden a little differently".

- *Debasish Mridha (2017)*

7.1 INTRODUCTION

Chapter 5 and 6 each presented an analysis of the conceptual model. The analysis presented in these chapters can be considered 'within-case' analysis. However, the objective of this study is not to determine how to cope more effectively with the complexity of multi-actor interaction within the TFU or UN MINUMSA. Instead we aim to develop a conceptual model which finds its ground in the empirical evidence of both case studies. Therefore, we need to describe the comparison of commonalities and differences both of them (George & Bennett 2005). Hence, a cross-case analysis is required (Miles and Huberman, 1994; Ruffa and Soeters, 2014).

Furthermore, since design science is an iterative process it should be repeated several times to enable the development of the final conceptual model (Markus et al., 2002). The cross-case analysis is considered the third iteration which enables the development of our final conceptual model to complete the illustration of the alternative for strategy development and implementation to cope more effectively with the complexity of stabilisation operations.

This chapter proceeds as follows: after this introduction we proceed with providing some background to the cross-case analysis (section 7.2). What follows is the presentation of the cross-case analysis. The cross-case analysis compares the TFU case study and the UN MINUSMA case study by chronologically following the constructs of the conceptual model: in section 7.3 we describe uncertainty and the impact on a system's condition followed by the illustration of a system's required self-organising ability in section 7.4. Section 7.5 illustrates how a stabilisation operation uses information to self-organise the differentiation and integration of its sub-systems, organisational resources and competencies into condition-dependent capabilities. The outcomes gained from condition-dependent capabilities are described in section 7.6. We conclude with an overview of the main findings of this chapter in section 7.7.

7.2 CROSS-CASE ANALYSIS

The aim of this study is to theoretically and practically introduce complex systems thinking as an alternative for strategy development and implementation of stabilisation operations, and support the debate over the extent to which integration is feasible and desirable. This study is embedded in practice, providing a rich set of narratives and data. Recommendations and conclusions are therefore grounded in both theory and practice. Reflecting on both the research objective and questions, a design-orientated approach with a system perspective of problem-solving together with design evaluation is best suited (Romme, 2003; Van Aken et al., 2009; Soeters et al., 2014). This study combines two research methods of solution-orientated research, namely design science (Romme, 2003; Hevner et al., 2004) and case study research (Yin, 2014) as illustrated in figure 1.1.

The aim of designing a conceptual model to cope more effectively with the complexity of multi-actor interaction during stabilisation operations corresponds with the concept of the design and evaluation of artefacts (Romme, 2003; Hevner et al., 2004). Design science has the goal of creating knowledge (i.e. design artefact) that practitioners can apply to gain understanding of real-world problems and their potential solutions (Hevner et al., 2004). The conceptual model is based on two real-world situations in order to support practitioners with the alternative for strategy development and implementation to cope more effectively with the complexity of multi-actor interaction during stabilisation operations. The conceptual model, as the primary design artefact, serves as the main outcome of this study.

To accomplish this goal, we need to understand the dynamics of each individual stabilisation operation (i.e. TFU and UN MINUSMA) and present their main findings (Chapter 5 and 6) regarding the conceptual model. Since the goal of this study is not to examine how to cope more effectively with the complexity of multi-actor interaction within the TFU or UN MINUMSA, but to develop a conceptual model based on the empirical evidence of both case studies, it is essential to synthesise evidence from the two case studies within our multi-case study design (George and Bennet, 2005).

By synthesising evidence from the two case studies we intent to compare the two different missions with a theory-testing purpose (Ruffa and Soeters, 2014). More specifically, we intent to compare how uncertainty derived from the environmental conditions as a dependent variable influences a system's condition, or to understand whether a system's conditions accounts for variations in its self-organising ability to create condition-dependent capabilities.

Moreover, when the many actors involved in stabilisation operations are deployed, they put into practice their strategy, resulting from the attempt to achieve certain ENDS (i.e. a desired situation in terms of objectives), through the choice of suitable strategic WAYS (i.e. the 'how' in the form of a concept), employing their MEANS (i.e. policy instruments by which some ENDS can be achieved) (Gray, 2005). By doing so, the many actors involved unveil the core characteristics of their respective organisations.

In organisation science time-related conditions or different conditions cannot be manipulated the way this is done in laboratory research (Ruffa and Soeters, 2014). Although over the last years, experimental design has been applied to the fields of political science as well as economics, feasibility and ethical issues surfaced with it (Beath et al., 2013). Therefore, for these disciplines a suitable solution will be that of quasi-experimental research (Campbell and Stanley, 1963).

This cross-case analysis is based upon the findings from the two case studies, namely the TFU and UN MINUSMA. Przeworski and Teune (1970) introduced two main research design when developing and analysing research propositions, namely cases that are most similar (see table 7.1), or the contrary, cases that are most dissimilar (see table 7.2).

As table 7.1 illustrates, case 1 to 5 are similar in regards to the variables X2 to X5. By contrast, there is comparable variation in X1 and Y. As a result, X1 may be regarded as a relevant variable which explains the differences in the dependent variable Y. This reasoning is related to the principle of verification which may lead to the explanation of causal inferences.

Table 7.1: Most-similar comparative research design with five cases and six variables.
Source: adapted from Ruffa and Soeters (2014).

	Case 1	*Case 2*	*Case 3*	*Case 4*	*Case 5*
Variable X1	0	0	0	+	+
Variable X2	0	0	0	0	0
Variable X3	0	0	0	0	0
Variable X4	+	+	+	+	+
Variable X5	+	+	+	+	+
Dependent Y	0	0	0	+	+

Figure 7.2 illustrates the opposite, namely an example of case 1 to 5 that differ in regards to the variables X2 and X5. Conversely, variables X1 and Y present similar results indicating that they co-vary in an identical manner. In other words, variable X1 and U could be causally interrelated. This reasoning is related to the principle of falsification which allows for excluding variables as explanatory factors that are irrelevant. According to Ruffa and Soeters (2014) this is also called small N-research due to the limited number of cases available for this type of research design.

Table 7.2: Most-different comparative research design with five cases and six variables.
Source: adapted from Ruffa and Soeters (2014).

	Case 1	*Case 2*	*Case 3*	*Case 4*	*Case 5*
Variable X1	+	+	0	+	+
Variable X2	+	+	+	0	0
Variable X3	0	+	+	+	0
Variable X4	0	0	0	+	+
Variable X5	+	0	+	0	+
Dependent Y	+	+	0	+	+

Reflecting on the above we applied the most similar-approach for the cross-case analysis. Reflecting on the conceptual model we understand the relationships (i.e. propositions) between the constructs as variables X1 and Y presenting similar results indicating that they co-vary in an identical manner. The cross-case analysis is summarised in table 7.3 and 7.4 and follows the chronological analysis of the conceptual model and provides the main findings for each construct and proposition respectively.

Table 7.3: Cross-case analysis of constructs.

Construct	**Operational variable**	**Measurable indicator**	**Findings TFU**	**Findings UN MINUSMA**
Internal organisation	Strategic model	1. Business strategy (WAYS) 2. Organisational strategy (MEANS) 3. Information strategy (WAYS + MEANS)	Impact uncertainty Modelling uncertainty Environmental uncertainty Uncertainty about outcomes	Impact uncertainty Modelling uncertainty Environmental uncertainty Uncertainty about outcomes
	System diversity	1. Time orientation 2. Interpersonal orientation 3. Goals orientation	Uncertainty about relations between actors	Uncertainty about relations between actors
External environment	Operating environment	1. Uncertainty derived from the environmental conditions; 2. The situational awareness about the environment; 3. The feedback received from the environment	Environmental uncertainty	Environmental uncertainty
	Simple	1. Degree of centralised control 2. Degree of self-organisation	Lack of data Lack of data	Lack of data Lack of data

		3. Information processing capacity	Lack of data	Lack of data
		4. Type of practice	Lack of data	Lack of data
A system's condition		1. Degree of centralised control	Single system integrated	Single system integrated
			Supra-system loosely integrated	Supra-system differentiated
		2. Degree of self-organisation	Compatibility Lack of integration effort*	Compatibility Lack of integration effort*
	Complicated		* Distinction between intentional choice (i.e. design) or determined by environmental demands.	* Distinction between intentional choice (i.e. design) or determined by environmental demands.
		3. Information processing capacity	Slack resources Investment in vertical information systems Creation of lateral relationships	Slack resources Creation of self-contained tasks Creation of lateral relationships
		4. Type of practice	Lack of data	Lack of data
		1. Degree of centralised control	Supra-system differentiated	Supra-system differentiated
		2. Degree of self-organisation	Integration effort positively impacts compatibility	Integration effort positively impacts compatibility
	Complex	3. Information processing capacity	Slack resources Investment in vertical information systems Creation of lateral relationships	Slack resources Creation of self-contained tasks Creation of lateral relationships
		4. Type of practice	Lack of data	Lack of data
		1. Degree of centralised control	Single system integrated Supra-system integrated	Single system weakly integrated Supra-system differentiated
	Chaotic	2. Degree of self-organisation		

			3.	Information processing capacity	Determined by environmental demands	Determined by environmental demands
			4.	Type of practice	Creation of lateral relationships	Creation of self-contained tasks
	Disordered		1.	Degree of centralised control	Lack of data	Lack of data
			2.	Degree of self-organisation	Lack of data	Remain status quo (absence of HNG in SHQ-N)
			3.	Information processing capacity	Lack of data	
			4.	Type of practice	Lack of data	Lack of data
					Lack of data	Lack of data
Required self-organising ability	Differentiation		1.	Compatibility	Ability of (sub-) systems to integrate or differentiate is caused by intentional choice (i.e. design) or determined by environmental conditions	Ability of (sub-) systems to integrate or differentiate is caused by intentional choice (i.e. design) or determined by environmental conditions
			2.	Integration effort		
	Integration		1.	Compatibility		
			2.	Integration effort		
Condition-dependent capabilities	Sub-system capabilities		1.	Integrated	Depend on the state of 'shared awareness' amongst the actors involved and ability to reconfigure their organisational capabilities	Depend on the state of 'shared awareness' amongst the actors involved and ability to reconfigure their organisational capabilities
			2.	Differentiated		
	System capabilities		1.	Integrated		
			2.	Differentiated		
	Supra-system capabilities		1.	Integrated		
			2.	Differentiated		
Outcomes	Operational				Dealing with 'wicked problems'	Dealing with 'wicked problems'
					Differences between outcomes and impacts	Differences between outcomes and impacts
			1.	Tangible		
			2.	Intangible		
	Strategic		1.	Tangible	Dependent on actors perspectives	Dependent on actors perspectives
			2.	Intangible		
					Requires a shift from focus on WAYS instead of ENDS	Requires a shift from focus on WAYS instead of ENDS

7.3 UNCERTAINTY AND THE IMPACT ON A SYSTEM'S CONDITION

Reflecting on the results of the two case studies we identified different types of uncertainty, namely impact uncertainty (i.e. sensitive dependence on initial conditions and *equifinality*), modelling uncertainty (imprecise

knowledge on how to control input), uncertainty about relations between actors, environmental uncertainty (i.e. unpredictable events and factors beyond control) and uncertainty about outcomes which impact the predictability of a system's condition, in turn influencing the multi-actor interaction during the two missions.

Impact uncertainty, modelling uncertainty, uncertainty about relations between actors and uncertainty about outcomes were found to be caused by two distinct factors, namely the missions' strategic model and system diversity. Environmental uncertainty were found to be caused by the operating environment. The different types of uncertainty can be divided in two dimensions, namely complexity and change. We found that internal and external complexity relates to the number of issues that a stabilisation operation had to attend and the degree to which they were interconnected. Internal and external uncertainty can be divided in two categories, namely complexity and change. Internal and external complexity relate to the number of issues to which stabilisation operations must attend and the degree to which they are interconnected. Internal and external change relate to the degree of discontinuous unintentional change that occurs within a stabilisation operation and in its environment. Furthermore, internal and external uncertainty can be categorised in four distinct domains (Duncan, 1972). Figure 3.3 illustrates the four dimensions and corresponding levels of internal and external uncertainty. Hence, we conclude that the complexity and degree of change that characterised the strategic model and system diversity of both stabilisation operations as well as the operating environment resulted in environmental conditions which were highly subject to uncertainty.

More specifically, the mission statement of both stabilisation operations was perceived by most interviewees as abstract. However, when one studies stabilisation operations through the scope of systems- and complexity theory a general and abstract mission statement fits perfectly with the complexity, dynamic and uncertainty of both the internal organisation and external environment, in turn, providing ground for an inherent order that identifies and models a system's overall behaviour through adapted and acceptable WAYS. Additionally, although the impact uncertainty and environmental uncertainty imposed a limitation on the predictability of both missions as complex systems, it has simultaneously revealed that certain ENDS may be the result of WAYS that started from different initial conditions as these differences could be amplified through positive feedback controls. Finally, system diversity (e.g. interpersonal orientation; goal orientation; time orientation) appeared to be an important factor that created friction amongst the TFU and UN MINUSMA's sub-systems as well as between the TFU and UN MINUSMA and various other systems as part of the supra-system.

7.4 SELF-ORGANISATION THROUGH DIFFERENTIATION AND INTEGRATION

The extent of the predictability of a system's condition can be explained through the level of understanding of the cause and effect relationships of the respective factors. Applying the Cynefin framework to the findings of the case studies turned out to be a useful tool to better understand and frame the non-linear

interactions. In short, the better the cause and effect relationship of a certain force is understood, the more likely a system settles into the ordered conditions. Conversely, a system characterised by factors with an unclear cause and effect relationship will more likely settle into the unordered conditions.

The linkages between a system's condition and the self-organising ability of a system are more ambiguous than expected. Whereas in most situations the relationship between two or more systems was found feasible, resource scarcity appeared to be an important source for incompatibility in others. Integration effort had a more non-linear character. In other words, integration effort was depending on the predictability of a systems condition. We found that an important distinction has to be made whether integration effort is based upon intentional choice (i.e. design) or determined by environmental demands (i.e. the fragile security situation). Whereby the former (driven by negative feedback controls) is more likely to differentiate. Conversely, the latter (driven by positive feedback controls) is more likely to integrate. Interestingly, integration effort was found to positively impact the compatibility of sub-systems to integrate.

The case studies indicate that information processing is the key operating process through which the *ex-ante* assessment takes place and hence self-organisation occurs. Although it may seem logical and expected that the various systems share information with each other, two factors for failure were identified. First, both stabilisation operations lacked any form of information strategy in support of their organisational strategy and business strategy. As a result, information could simply not be shared in an effective and secure manner. Second, the desirability of actors to share information combined with the classification of the information are important determinants for the ex-ante assessment. Ideally, the systems involved share information to create a common understanding which subsequently leads to emergent behaviour and ultimately condition-dependent capabilities.

Table 7.4 presents an overview of the cross-case analysis by following the chronological analysis of the conceptual model including the main findings for each proposition.

Table 7.4: Cross-case analysis of propositions.

PROPOSITION	TFU	UN MINSUMA
Proposition 1a: The uncertainty derived from the internal organisation impacts the predictability of a system's condition	Supported	Supported
Proposition 1b: The uncertainty derived from the external environment impacts the predictability of a system's condition	Supported	Supported
Proposition 2: The dynamic equilibrium of a system's condition is expected to positively impacts its required self-organising ability	Supported	Supported
Proposition 3: A system in dynamic equilibrium is expected to be mainly driven by non-linear feedback controls, thereby enabling its required self-organising ability to differentiate and integrate	Supported	Supported
Proposition 4:	Supported	Supported

A system's self-organising ability to differentiate and integrate is expected to positively impacts the development of condition-dependent capabilities		
Proposition 5: The development of condition-dependent capabilities impact the attainment of outcomes yet, policy impacts will be difficult to measure and actor dependent.	Supported	Supported

7.5 CONDITION-DEPENDENT CAPABILITIES

Although the self-organising ability of a system to integrate and differentiate its sub-systems, organisational resources and competencies was hindered by the lack of information processing, condition-dependent capabilities were developed. This is mainly due to a high degree of integration effort matching the strong distributed connections that were observed in the "complicated" and "complex" situation where most integration was found. However, our findings indicate that the strong bureaucratic processes of both stabilisation operations hampered the speed of the development of particularly supra-system capabilities. Whereas the development of sub-system capabilities were mostly the outcome of prior shared intentions (i.e. design), system and supra-system capabilities, by contrast, were the result of emergence from nonlinear interactions between the sub-systems or systems in the absence of prior shared intentions or were determined by environmental demands (i.e. the fragile security situation).

7.6 OUTCOMES

Finally, although we argue that condition-dependent capabilities positively impact the generated outcomes, the latter remain hard to determine and measure. More importantly, although some system capabilities or even supra-system capabilities were focused on direct support to the local population it is questionable if certain outcomes could be labelled "positive impacts" (e.g. woman's rights violations and child labour) due to the fact that the participating systems had different views of a situation and subscribed to different priorities and preferences for particular solutions. Moreover social complexity resulted in different options in regards to what was fair and just in policy making.

7.7 DISCUSSION

In sum, differences in both problem perception and the perception of an expected situation (i.e. ENDS) illustrate the different types of uncertainty that impacted the predictability of both missions their condition, in turn influencing the multi-actor interaction during both mission. Particularly, impact uncertainty, modelling uncertainty, uncertainty about relations between actors, combined with environmental uncertainty resulted in uncertainty about outcomes. Most of these uncertainties only became observable once both missions were deployed and therefore automatically became part of a supra-system (e.g. IOs,

NGOs, host nation government, local actors as well as the private sector). As a result, we view the stabilisation operations as complex systems which are sensitive to their initial conditions and, once deployed part of a greater supra-system, of which the effectiveness of the strategic model depends primarily on its ability to respond to the changing environmental conditions.

The purpose of this cross-case analysis was to make a comparison between the analyses of the conceptual model of the two case studies and identify key themes that were common among both of them as well as minor differences between them. As illustrated above, although the TFU and UN MINUSMA had a distinct character in terms of foundation (i.e. NATO and UN), the main findings for each construct and proposition are yet comparable.

The cross-case analysis is considered the third iteration which enables the development of our final conceptual model. In addition to the cross-case analysis, we presented the final conceptual model to 5 senior members of the Ministry of Defence and Ministry of Foreign Affairs of the Netherlands (see appendix A5) as well as to complex systems scientists at the International Conference on Complex Systems 2018 in Cambridge (MA). One could consider this an *ex-post* reflection and fourth iteration of the conceptual model to provide the final information feedback over both the model itself as well as the process for explanation building. In the next chapter we will proceed with the presentation of the final conceptual model and derivative design guidelines.

8

Designing for future stabilisation operations: towards a final model[7]

"It is not the strongest of the species that survives, not the most intelligent that survives. It is the one that is the most adaptable to change, that lives within the means available and works co-operatively against common threats".

Charles Darwin (1859)

8.1 INTRODUCTION

The insights gained from the TFU case study, UN MINUSMA case study and cross-case analysis provide us with a thorough understanding of the theoretical constructs which form the foundation of the final conceptual model. The final conceptual model is used to finalise the empirical part of this study and serves as an enabling practice for organisational design of future stabilisation operations. Additionally, we presented the final conceptual model to 5 senior members of the Ministries of Defence and Foreign Affairs of the Netherlands (see appendix A5) as well as to complex systems scientists at the International Conference on Complex Systems 2018 in Cambridge (MA). One could consider this an *ex-post* reflection and fourth iteration of the conceptual model to provide the final feedback over both the model itself as well as the process for explanation building.

This chapter is organised as follows: after this introduction, the final conceptual model is presented which seeks to answer the main research question of this study. While answering the main research question, we also aim to answer the sub-questions as defined in chapter 1. We then introduce some additional theories that add robustness to the constructs, complimented with the presentation of the derivative design guidelines. We do this by following the chronological analysis of the final conceptual model: in section 8.2 we describe uncertainty and the impact on a system's condition followed by the illustration of a system's required self-organising ability in section 8.3. Section 8.4 provides an overview of a complex system uses information to self-organise the differentiation and integration of its sub-systems, organisational resources and competencies into condition-dependent capabilities. The outcomes gained from condition-dependent

[7] Parts of this chapter have been presented at the following peer reviewed conference:
Gans, B.: Understanding stabilization operations as complex systems. Ninth International Conference on Complex Systems (ICCS 2018), July 22 – 27 2018, Cambridge MA, USA.

capabilities are described in section 8.5. We conclude with a brief discussion of the main findings of this chapter in section 8.6.

8.2 UNCERTAINTY AND THE IMPACT ON A SYSTEM'S CONDITION

The content of this section aims to provide answers to the following sub-question:

Q1. How do the environmental conditions impact stabilisation operations?

The two iterations of the initial conceptual model enabled us to identify different types of uncertainty that impact the predictability of a system's condition, in turn influencing multi-actor interaction during stabilisation operations. The five uncertainties recognised by the 5 *ex-post* interviewees are:

1. Impact uncertainty (i.e. sensitive dependence on initial conditions and *equifinality*);
2. Modelling uncertainty (imprecise knowledge on how to control input);
3. Uncertainty about relations between actors;
4. Environmental uncertainty (i.e. unpredictable events and factors beyond control);
5. Uncertainty about outcomes.

Figure 8.1 illustrates the above described types of uncertainties in regards to stabilisation operations as complex systems.

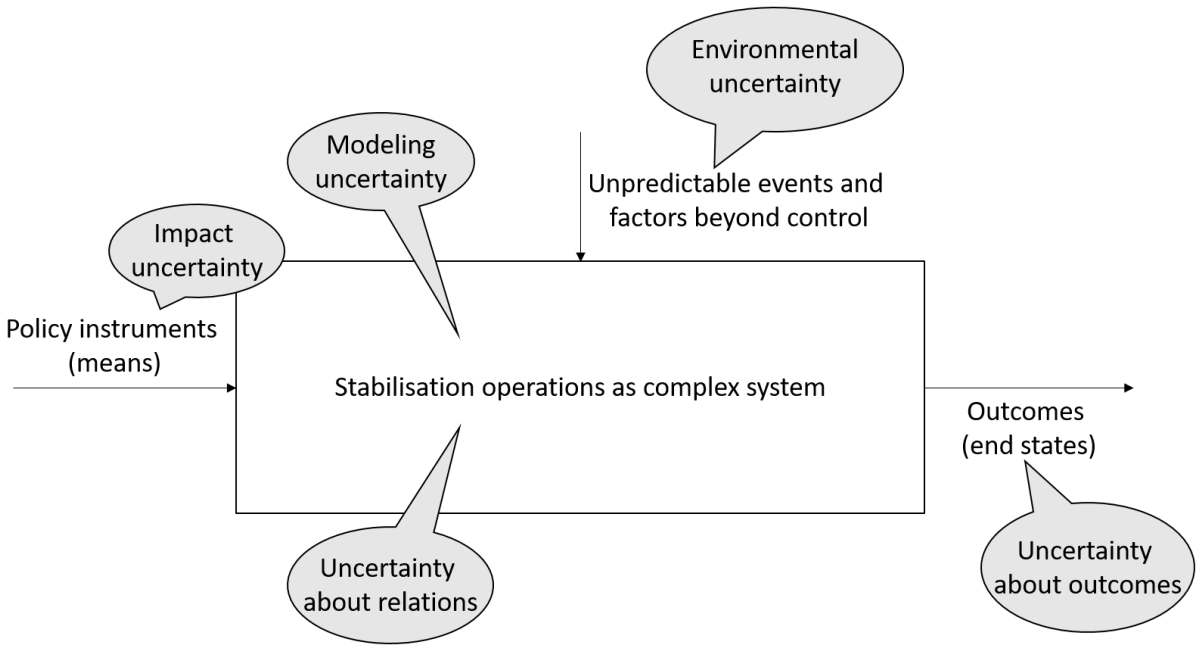


Figure 8.1: Types of uncertainties in regards to stabilisation operations as complex systems.

As the influential physicist Bohr (1922) taught us: "prediction is very difficult, particularly if it is about the future" (p. 286). Predictions are attempts to make absolute statements about the future. According to Poincaré (1958) the sensitivity to initial conditions prevents us from making any reliable predictions: "a very

slight cause, which escapes us, determines a considerable effect which we cannot help seeing, and then we say this effect is due to chance. If we could know exactly the laws of nature and the situation of the universe at the initial instant, we should be able to predict exactly the situation of this same universe at a subsequent instant. But even when the natural laws should have no further secret for us, we could know the initial conditions only approximately. If that permits us to foresee the subsequent situation with the same degree of approximation, this is all we require, we say the phenomenon has been predicted, that it is ruled by laws. But this is not always the case; it may happen that slight differences in the initial conditions produce very great differences in the final phenomenon; a slight error in the former would make an enormous error in the latter. Prediction becomes impossible and we have the phenomenon of chance" (p. 364).

If prediction now is understood to be impossible, we may look into possibilities to understand better the general behaviour of stabilisation operations as complex system through the identification of schemata. In other words, whereas prediction is focused on a quantitative analysis (i.e. mathematical calculation) of the condition of the complex system, there needs to be shift towards a more qualitative analysis which should aim on the strategic modelling of its overall long-term behaviour. Conducting a qualitative analysis can be viewed of as exploring potential future events, which is relevant because most stabilisation operations efforts are focused on certain future end states. According to Enserink et al. (2010) the objective of exploration of the future is "not to predict the future, but to explore plausible futures, so analysts and problem owners become aware of the uncertainties of and around their policy problem. This exploration can relate to the development of the problem, the effects of possible solutions in the future, as well as to the possible futures and environments of the problem" (p. 109). Such a qualitative analysis of the future is not only relevant for understanding the general behaviour of stabilisation operations, it also provides ground to achieve a certain level of control over it. In complexity theory this is known as 'chaos control' which is best described by King (2000) as follows: "rather than trying to figure out all the chains of causality, the [non-linear] modeller looks for nodes where feedback join and tries to capture as many of the important loops as possible in the system's "picture". Rather than shaping the model to make a forecast about future events or to exercise some central control, the non-linear modeller is content to perturb the model, trying out different variables in order to learn about the system's critical points and its homeostasis (resistance to change). The modeller is not seeking to control the complex system by quantifying it and mastering its causality; (s)he wants to increase his/her "intuitions" about how the system works so (s)he can interact with it more harmoniously" (p. 54).

Therefore, applying methods for exploring uncertainties are extremely useful to evaluate whether the system's demarcation (i.e. system's boundary), its environment and all relevant actors and factors (i.e. different types of uncertainties) have been included and classified in a plausible way. Moreover and as mentioned by two *ex-post* interviewees, qualitative analysis clarifies the distinction between the selection of policy instruments (means) and uncertainties form outside the system's boundary, and how they influence (via causal relations) the effectiveness of exploration as a policy instrument, ultimately enabling the determination of a system's condition.

Applying methods for exploration, and particularly scenario development, are important tools to cope with uncertain environmental conditions and expand actors thinking (Schoemaker, 1993). Scenario development has the goal to contribute to policy forming and system's design (Bishop et al., 2007). The purpose of scenario development is creating an "alternative future". When speaking about scenario development, an important distinction with scenario planning needs to be made. Whereas the former focuses on creating actual stories about the future, the latter includes a complete foresight study. Hence, scenario development could be an element of the much more comprehensive activity of scenario planning (Bishop et al., 2007). These methods are an instrument of analysis that can be used to challenge the many actors involved in stabilisation operations to co-think *ex-ante* about the exploration of the identified types of uncertainties and their impact on the initial condition of stabilisation operations as complex system. Additionally, these methods should be used to co-design images of (current and future) scenarios to enable the development of condition-dependent capabilities. Most importantly, applying these methods have the potential to enlarge the support of the stabilisation mission itself.

Literature on scenarios distinguishes two types of scenarios, namely exploring or normative (Schoemaker, 1993; Bishop et al., 2007). Exploring scenarios are used to illustrate one or more possible images of a future without determining its desirability. This is also known as 'forecasting'. By contrast, a normative scenario makes use of a desired image of the future which is considered a suitable end-state. By applying normative scenarios, one should be able to design the path to the formulation of the start of the mission from the desired end-state, with the goal to determine which MEANS and WAYS could lead to the desired ENDS (Ensering et al., 2010). This is also called 'back casting'. Since stabilisation operations are characterised by five distinct types of uncertainties that impact the predictability of a system's condition, applying both types of scenarios is considered most effective. We will address this in more detail below.

According to Walker (2000) the first step in policy forming and system design is "developing a system diagram that clarifies the system by (1) defining its boundaries and (2) defining its structure – the main elements and the relationships among them" (p. 13). This means that system demarcation and problem formulation are closely connected. Typically, a system diagram is actor-specific since it describes a system form the viewpoint of a specific actor. However, as demonstrated in this study, stabilisation operations are complex systems interacting with other complex systems (e.g. IOs, NGOs, local actors both state and non-state and the private sector) in complex environments. All these systems together form a greater supra-system constituting of multiple interacting systems. In other words, when deploying a stabilisation operation such as the TFU or UN MINUSMA it automatically becomes part of a larger supra-system in which each individual system needs to find its balance between order and chaos. Hence, mutual adjustment through consultation and coordination is essential in order to prevent systems from being isolated from their environment, and to apprehend their interconnectedness (Alberts and Hayes, 2003). Consequently, the development of a systems diagram (see figure 8.2) should be employed by multidisciplinary design teams which preferably include actors of the respective systems, who, in the course of the design process, put

forward their ideas and results several times to a broad forum of other creative and critical experts. As emphasised by a diplomat:

> "In order to successfully attract NGOs and private firms for an integrated approach they need to be engaged at the initial decision-making process. Collaborative goals need to be developed so those NGOs and private firms can conduct their own long-term planning and allocation of resources. Talking about the analyses, what is the problem, what are we going to do about it? There you have the possibility to really include the options for the NGOs and the private sector to take their role". (TFU HQ, R2).

This should be done not only to safeguard quality, but also to cope more effectively with the complexities of multi-actor interaction (i.e. creating social consensus), namely the social complexity (e.g. extreme cultural differences; behaviour to maximise an actor's own interest; differences in problem perception). Moreover, since this social complexity is boosted by interdependencies, differences in power, knowledge and information, a holistic approach to exploration should be applied in order to improve the coordination between the many actors and across hierarchies, thereby increasing the effectiveness of the scenarios as a policy instrument. It was the Prussian general von Clausewitz (1832) who was already aware of the limitations of traditional analysis, and taught us about the profound interconnectedness of open systems with their environment: "it is bound to be easy if one restricts oneself to the most immediate aims and effects. This may be done quite arbitrarily of one isolates the matter from its setting and studies it only under those conditions. But in war, as in life generally, all parts of the whole are interconnected and thus the effects produced, however small their cause, must influence all subsequent military operations and modify their final outcome to some degree, however slight" (p. 82).

In a wide range of disciplines, complex problems are typically solved in four steps: intelligence, design, choice and implementation (Simon, 1977). For stabilisation operations, the actors of the systems involved preferably start out with an abstract end-state (ENDS), and then use these abstract ENDS to select various possible policy instruments (i.e. MEANS) to pursue their interests and influence the supra-system, improving the degree to which the determined goals may be realised should be described in various policy scenarios (i.e. WAYS or the 'how').

A detailed policy scenario (i.e. 'back casting') describes the exploration of possible policy mechanisms that could be deployed to achieve the desired ENDS, as illustrated in the system diagram (see figure 8.2). This could provide the multi-disciplinary design team with a clear picture of what the individual systems want to accomplish (i.e. intelligence), followed by the determination of how much integration is feasible and equally how much integration is desirable (i.e. design). By doing so, the actors involved are able to intentionally choose for an integrated or differentiated design with appropriate governance arrangements needed to influence the system.

As illustrated in figure 8.2, scenario development includes the exploration of the external factors (i.e. 'forecasting') and how they influence the effectiveness of exploration as a policy instrument. The combination of policy and context scenarios deal with the images of the whole. Therefore, strategic

scenarios are used to clarify strategic choices between kinds of developments or policies by providing insight into the expected effects.

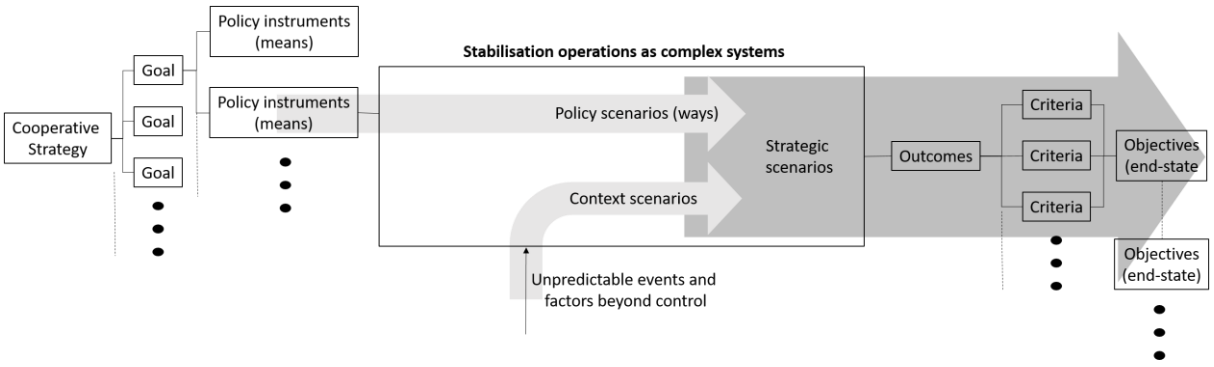


Figure 8.2: System diagram: from cooperative strategy to end-states.

Since many actors involved in stabilisation operations hold different ideas on both what is desired and have different perceptions of the existing (or future) situation, developing a system diagram from initial strategy to ENDS is complicated (see figure 8.3). More specifically, the many actors involved have different thoughts about the situation or problem and about how these should be formulated and solved. The term 'problem perception' is used to illustrate the diverging views that ultimately lead to different problem definitions. Differences in problem perception typically occur when there are different impressions of the existing or expected situation and the desired situation.

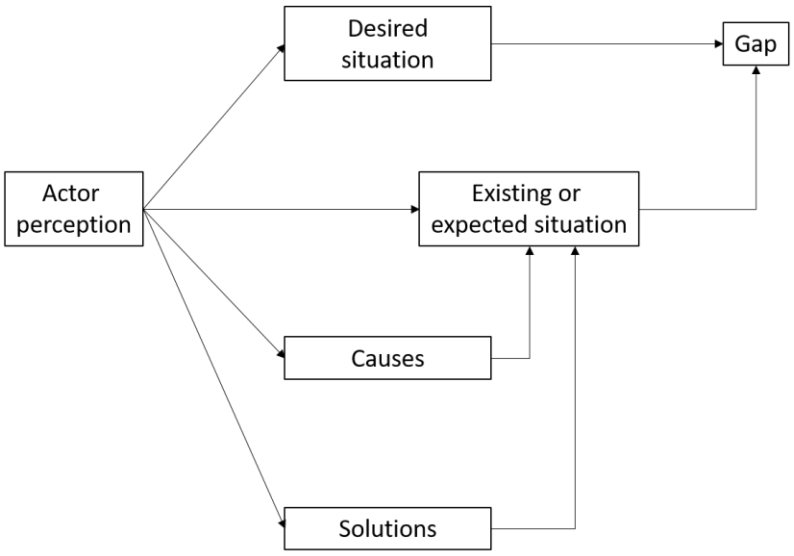


Figure 8.3: Problems as perceived gap. Source: adapted from Enserink et al. (2010).

Reflecting on the above, we could conclude that perceptions are connected to individual actors. As a result, one could find a stabilisation operation with one actor thinking in terms of problems while another actor is thinking in terms of solutions. Several explanatory variables can be found in the literature which explain

differences in perception (Simon, 1977; Enserink et al., 2010; Von Hippel and Von Krogh, 2016). Examples of such variables are the background and history of the actor concerned, the position and interests of the actor, communication patterns, individual reference frameworks, the available vocabulary and the modelling method. Moreover, for 'wicked problems', it is possible that consensus cannot be achieved over problem formulation since the externalities are severe (Rittel and Weber, 1973). Consequently, problem formulation is a key element of strategic modelling.

A system's initial condition. Due to the identified impact uncertainty, we first introduce a system's initial condition which deals with the sensitive dependence on its initial conditions, a key characteristic of stabilisation operations as complex systems. The first step in determining a system's initial condition is by positioning the situation or problem in the context of systems and complexity thinking. The analysis of the uncertainty derived from the environmental conditions in regards to a particular situation or problem then needs to be conducted by the members of a multi-disciplinary design team, who, each from the viewpoint of their organisation participate in the analysis and develop a strategic model that is aimed at improving the situation that is perceived as a problem by their respective organisation. As described in the above section, having some level of consensus in regards to the problem formulation is essential in order to define some form of abstract end-state. According to Koppenjan (1990) a suitable solution for this issue is to view all ways of reducing the gap as fundamental and should focus on the causes of a problem situation, the characteristics and consequences of a problem situation, the perceptions of stakeholders in regards to the two previous points and the views and ideas of the desired situation (objectives). By conducting an analysis of the uncertainty derived from the environmental conditions in regard to particular situation or problem, the multi-disciplinary design team obtains clarity and possibly consensus about the respective factors that may influence a particular situation or problem. By doing so, the multi-disciplinary design team should be able to develop measures that address one or more of the aspects that could reduce the gap, depending on the availability and acceptability of MEANS (as illustrated in figure 8.5).

The analysis of the uncertainty derived from the environmental conditions in regard to particular situation or problem, described in strategic scenarios is thus an activity which is fundamental to strategic modelling. Hence, it requires an appropriate amount of time and attention in order to allow the members of the multi-disciplinary design team to deliver strategic advises to their respective organisations. Table 8.1 depicts the characteristics of such an analysis.

Table 8.1: Characteristics of problem analyses. Source: adapted from Enserink et al. (2010).

Activity	Method
A clear and well-thought out introduction to the problem (e.g. context, history)	
A precise identification of the client and other relevant actors	
A concise description of the problem (what is the desired situation and how is that measured, what is the present or expected situation, and what is the gap between these two situations?)	Objectives tree

A demarcation of the aspects and factors that are important (what does the problem relate to?)	Causal relation diagram and system diagram
An overview of potential solutions	Means-ends diagram
A thorough and in-depth problem formulation that pays attention to the causes of the problem (factors) as well as to the context of the problem (the views on the problem and the solutions of other actors involved and aspects that the client did not think were relevant	Actors and network analyses Target audience analyses
An indication of substantive certainties and uncertainties (reliability of a problem analyses and formulating of knowledge gaps for further research)	
An indication of strategic threats and opportunities (the context of the analyses, how to fit into the whole process of problem solving)	
A basis of support with the client, and far as possible also with other actors that are needed in the process of problem solving	

To summarise, the predictability of a system's initial condition can be best explained through the level of understanding and consensus of the analyses of the uncertainty derived from the internal organisation and external environment in regard to particular situation or problem. The better the causes of a problem situation, the characteristics and consequences of a problem situation, the perceptions of stakeholders in regard to the two previous points and the views and ideas of the desired situation (objectives) are understood and consensus is achieved, the more likely the system settles into stable equilibrium (i.e. order). By contrast, a system characterised by low-level of understanding and consensus over a particular problem situation will more likely settle into the unstable equilibrium (i.e. chaos). However, as demonstrated in this study, the environmental conditions of stabilisation operations are so complex that three additional forms of uncertainties were found in the data, namely modelling uncertainty, uncertainty about relationships and environment and context uncertainty. Hence, we need to think of a hybrid or malleable organisational form which imposes some form of order on this chaotic initial condition. In terms of strategic management this hybrid or malleable organisational form can be seen as the intended strategy as presented to us by Mintzberg (1978).

Applying the Cynefin framework to the findings of the case studies turned out to be very effective to understand better and frame the non-linear interactions. However, reflecting on the findings of the case studies we introduce a simplified framework which consists of three specific situations that better match the specific context of stabilisation operations and which describes three initial conditions and derived organisational strategies, namely bureaucratic order, organised anarchies and chaos control. The initial conditions serve as metaphor to illustrate the hybrid organisational strategy needed to cope more effectively with the uncertain and ambiguous circumstances (see figure 8.4), and accomplish organisational goals. Following the Information Systems Strategy Triangle (introduced in Chapter 5) these different organisational strategies, should be in alignment with the information strategy.

The three respective organisational strategies include the system's design, as well as how to command, control and coordinate the managerial processes. Table 8.2 provides an overview of the organisational

design variables from the managerial levers framework (Cash et al., 1994) we used to develop the three respective organisational strategies.

Table 8.2: Organisational design variables. Source: adapted from Cash et al. (1994).

Organisational design variable	Description
Decision right	Authority to initiate, approve, implement, and control various types of decisions necessary to plan and run the organisation.
Organisational process	The set of ordered tasks needed to complete key objectives of the organisation.
Formal reporting relationships	The structure set up to ensure coordination among all (sub-) systems within the (supra-) system; reflects allocation of decision rights.
Informal networks	Mechanism, such as ad hoc groups, which work to coordinate and transfer information outside the formal reporting relationship.

Before we introduce the new framework and derived organisational strategies in more detail, we first examine four types of organisation structures and their characteristics. Traditionally, an organisational structure could be hierarchical, flat or matrix. More recently, the network form is introduced to complement the other three types. The characteristics of the four types of organisation structure are presented in table 8.3.

Table 8.3: Comparison of organisational structures. Source: adapted from Pearlson and Saunders (2009).

	Hierarchical	Flat	Matrix	Networked	Chain collaboration
Description	Bureaucratic form with defined levels of management	Decision making pushed down to the lowest level in the organisation	Workers assigned to two or more supervisors in an effort to make sure multiple dimensions of the organisation are integrated	Formal and informal communication networks that connect all parts of the organisation	Joint planning and implementation of supply chain operations by two or more organisations
Characteristics	Division of labour, specialisation, unity of command, formalisation	Informal roles, planning and control, often small and young organisations	Dual reporting relationships based on function and purpose	Known for flexibility and adaptability	Sharing of responsibilities resources and information
Type of environment best supported	Stable Certain	Dynamic Uncertain	Dynamic Uncertain	Dynamic Uncertain	Dynamic Uncertain
Basis of structuring	Primary function	Very loose	Functions and purpose (i.e. location,	Networks	Vertical and horizontal collaboration

			product, customer)		
Power structure	Centralised	Decentralised	Distributed (matrix managers)	Distributed (network)	Distributed (network; channels)

As demonstrated by Bar-Yam and Minai (2003), the organisational structure of stabilisation operations needs to shift from a strong hierarchical organisation with its focus on internal efficiency (i.e. a closed system) towards a network consisting of loosely connected components. This should allow for emergent behaviour, which in turn require matching organisational variables which provide ground for adaptation to the different type of uncertainties. This form is that of the networked organisation structure. Applegate et al. (1988) described this organisation structure as "rigid hierarchies are replaced by formal and informal communication networks that connect all parts of the company… [This type of organisation structure] is well known for its flexibility and adaptiveness" (p. 128 – 136). Thus, the networked organisation structure is particularly well suited to the dynamic, unstable environments which characterise stabilisation operation. Network organisation structures are typically characterised by their decentralised decision-making and distributed ICTs that offer an alternative for the hierarchical organisation structures which are considered to be inflexible. Indeed, as described by Bar-Yam and Minai, 2003) hierarchical structures are found to be less efficient in conditions that are characterised by high complexity: "hierarchical command systems are designed for the largest scale impacts and thus relatively simple warfare. Indeed, traditional military forces and related command, control and planning, were designed for conventional large scale conflicts. Distributed control systems, when properly designed, can enhance the ability to meet complex challenges" (p. 1). Military theorists Arquilla and Ronfeldt (1997) argue that the changing security environment requires "major innovations in organisational design, in particular a shift from hierarchies to networks. The traditional reliance on hierarchical design may have to be adapted to network-oriented models to allow greater flexibility, lateral connectivity, and teamwork across institutional boundaries. The traditional emphasis on command and control, a key strength of hierarchy, may have to give way to an emphasis on consultation and coordination, the crucial blocks of network designs" (p. 45). In contrast to insurgents, guerrillas and terrorist organisations, this form of organisational structure does not match with our traditional emphasis on hierarchy which is relates to a human's desire for control (Tajfel and Turner, 1979). Hence, stabilisation operations face an inevitable paradox between their ability to adapt to the changing environmental conditions and the ability to apply the network organisational structure when deploying the purposeful activities of all the participating actors from the various systems as part of the supra-system. However, all interviewees stressed the importance that it is not feasible nor desirable for the participating actors (most notably state actors) to completely abandon hierarchical organisation structure. Therefore, we have designed and presented three distinct forms of network organisation structure (i.e. hybridisation) which offers the ability to balance between flexibility and adaptability while maintaining some hierarchical characteristics and centralised control.

Bureaucratic order. In the bureaucratic order we propose to find a situation in which the participating systems gain a deep understanding and consensus of the analysis of the uncertainty derived from the environmental conditions in regards to particular situation or problem. In other words, the relationship between cause and effect of the uncertainty derived from the internal organisation as well as the external environment and a system's initial condition is complicated but proportional and indestructible. Thus, with sufficient time, information and resources, the members of a multi-disciplinary design team should be able to explore cause and effect relationships and use them for strategic scenarios. As a result, stabilisation operations will find themselves in stable equilibrium which is characterised by a loosely coupled supra-system with functional independence of its systems with limited mobility within the supra-system if the environmental conditions require so. As a result, this organisational structure is characterised by tightly coupled systems coupled systems with centralised control mechanisms and limited emergent behaviour. The leadership of each system imposes control mechanisms that enables it to increase its efficiency when all works smoothly. However, one small disturbance may have a huge impact on the whole system, thereby affecting the supra-system modestly resilient to unexpected changes in environmental conditions.

Organised anarchies. In organised anarchies we expect situations in which the cause and effect relationships of the uncertainty derived from the internal organisation as well as the external environment and a system's initial condition cannot be explored *ex-ante*. However, as events evolve actors may be able to understand how they were initiated, that is, *ex-post*. On the one hand, this is the initial condition in which the behaviours of the participating systems never fit perfectly within the supra-system, they neither display chaotic behaviour on the other hand. Therefore, we expect to find stabilisation operations in a dynamic equilibrium which is characterised by a moderately coupled supra-system with limited functional dependence of sub-systems on the one hand, and moderately coupled systems with decentralised control mechanisms which allows for emergent behaviour which makes them resilient to the complex and rapid changing environmental conditions.

Chaos control. In chaos control we expect to find situations in which the cause and effect relationships of uncertainty derived from the internal organisation as well as the external environment and a system's initial condition factors cannot be explored *ex-ante* or *ex-post*. Hence, we propose to find stabilisation operations in an unstable equilibrium characterised by a loosely coupled supra-system with functional independence of sub-systems and loosely coupled systems with chaos control mechanisms which result in little resilience to large-scale perturbations. As a result, in these situations the participating systems are sensitive for dissolving into turbulence.

In sum, in this first part of our final model (see figure 8.4) we offer a combination of control and exploration on one hand, and decontrol and adaptability on the other hand. We understand that due to characteristics of the many actors participating in stabilisation operations it is feasible nor desirable for individual actors to completely ignore hierarchical structures and some form of centralised control. Therefore, individual

systems need to balance between order (i.e. control) and chaos (i.e. adaptability) in the interoperability continuum.

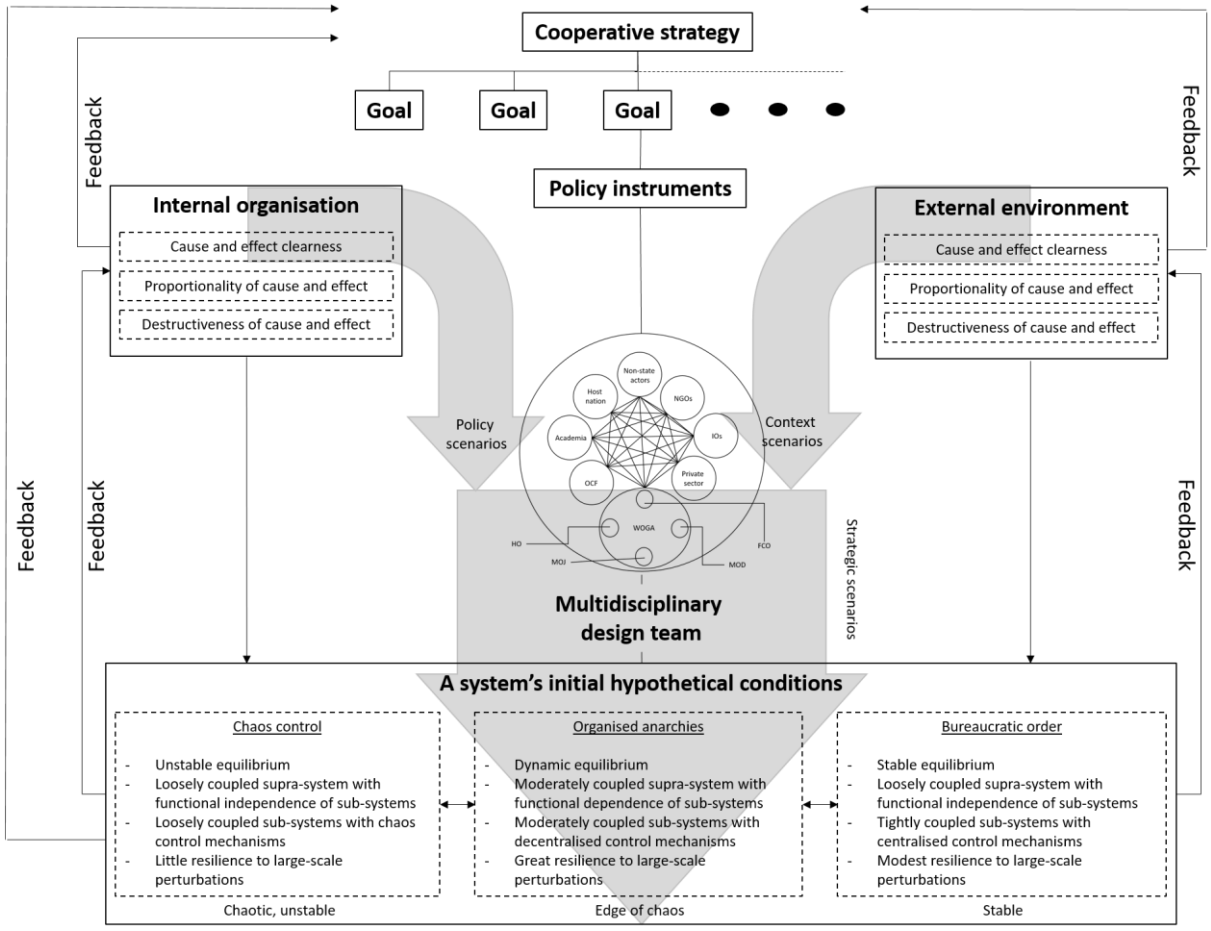


Figure 8.4: Final representations of a system's initial conditions.

The process is circular in its way that the participating systems absorb information derived from the exploration of respective internal factors, identify regularities and subsequently translates this information into policy scenarios. By contrast, the participating systems absorb information derived from the exploration of the respective external factors, identify regularities and subsequently translate this information into context scenarios. The combination of policy scenarios and contextual scenarios result in strategic scenarios which provide an image of the whole. In our model, strategic scenarios are used to support strategic choices in regard to the desired organisational design variables including organisation strategy, structure, processes and derivate level of control by offering insight into the expected outcomes. Finally, results derived from these strategic choices will feedback in order to maintain the perpetually evolving nature of strategic scenarios (i.e. schemata) when faced with new information. This circular process is essential in order to impose order on chaos in the perpetually renewed world of stabilisation operations that is uncertain, ever-changing and unpredictable. Strategic scenarios should thus support a strategy for a long term sustainable stabilisation operation through aligning the multi-actor capabilities following an initial cooperative and flexible strategic model. Such a model should focus specifically on the 'why' question as well as on 'how'

(WAYS + MEANS) to intervene. Moreover, such a model is supported by different strategic scenarios in order to allow for a stabilisation operation to enhance their responsiveness (i.e. cooperative adaptability) to the different types of uncertainties, most importantly their sensitive dependence on initial conditions.

Taken together we suggest that:

Design guideline 1a:
Members of a multidisciplinary design team with a deep understanding and consensus of the uncertainty derived from the environmental conditions and their impact on a system's initial conditions should explore cause and effect relationships, use them for strategic scenario development and will subsequently settle a system in bureaucratic order.

Design guideline 1b:
Members of a multidisciplinary design team with a low level of understanding and consensus of the uncertainty derived from the environmental conditions and their impact on a system's initial conditions will be hindered to explore cause and effect relationships, be able to conduct strategic scenario development only to a limited extent and will subsequently settle system in organised anarchies.

Design guideline 1c:
Members of a multidisciplinary design team that are unable to establish any level of understanding and consensus of the uncertainty derived from the environmental conditions and their impact on a system's initial conditions will be unable to explore cause and effect relationships, nor conduct strategic scenario development and will subsequently settle a system in chaos control.

8.3 SELF-ORGANISATION AND THE FACTORS OF INTEGRATION AND DIFFERENTIATION

The content of this section aims to answer the following sub-question:

Q2. How do stabilisation operations respond to the complexity derived from the environmental conditions?

Our model suggests that the uncertainty derived from the environmental conditions and their impact on a system's initial condition is linear and hence characterised by the mathematical principles of proportionality and superposition (see chapter 2) However, on the contrary a specific factor may emerge weakly and grow in strength over time until a response from the system is initiated. The response to a specific factor could emerge as an incident or as a point of evolutionary punctuation which could change the impact on or bring about discontinuous change to other factors (Carney and Gedajlovic, 2002). For instance, the removal of Jan Mohamed Khan as the governor of Uruzgan Province and the subsequent negative effects on the security situation throughout the Province found in the TFU case study. To put it differently, the very nature

of the uncertainties derived from the internal organisation and external environment is continuously nonlinear and thus makes prediction impossible. This dynamic has severe implications for the planning of stabilisation operations since this needs to be based on assumptions instead of facts as emphasised by the Prussian Field Marshal von Moltke (1871): "no plan of operations extends with any certainty beyond the first contact with the main hostile force" (p. 124). Moreover, and according to Liang and Xianqsui (2015) "planning that seeks to tie a war to a set of ideas within a predetermined plan is little short of absurdity or naïveté" (p. 215). In other words, stabilisation operations are indeed inherently sensitive to initial conditions. As a result, the effectiveness of stabilisation operations depends, apart from the development of strategic scenarios, for the most part on their ability to respond to changing environmental conditions.

To illustrate the organisational adaptability of stabilisation operations we add a co-evolutionary framework to our final model (see figure 8.5 – P2). After the initial design process in which the strategic scenarios ideally are developed by a multidisciplinary design team, the systems involved take the form of one of the three presented initial conditions and calibrate their organisational form and derived control mechanisms accordingly to fit the most likely strategic scenario. This should serve as the intended strategy (Mintzberg, 1978). It is important to note that this selected initial condition constitute an influence on the constantly changing environment to which the system has adapted (Baum and Singh 1994). To put it differently, while a stabilisation operation adapts to its respected environment, it simultaneously shapes this same environment since the output produced has a certain effect. From an organisational perspective, the formal organisation (focusing on executing daily operations as efficiently as possible to attain the organisation's goals) of systems should be driven by negative feedback which generates stable behaviour. By contrast, the informal organisation (a network of interpersonal relationships focusing on norms, values and beliefs) of the systems may be driven by positive feedback controls which generates stable behaviour. Thus, stabilisation operations should be driven by non-linear dynamics to maintain a certain level of control while providing ground for emergence and self-organisation.

It is therefore we suggest that:

Design guideline 2:
Stabilisation operations should be driven by non-linear feedback controls in order to provide ground for a state of dynamic equilibrium, which in turn, positively impacts their required self-organising ability to differentiate or integrate.

Once the selected condition is influenced by changes derived from the internal organisation and external environment, it should seek to adapt and calibrate its organisational structure and derived control mechanisms to better fit with its new environmental conditions. Our co-evolutionary framework expects a bifurcation in a system's conditions between the established organisational form (i.e. driven by the formal organisation) and the emergence of a new organisational form (i.e. driven by the informal organisation).

First, we propose that the initial established organisational structure adapts its processes and control mechanisms through well-defined hierarchical structures, rules and procedures to sustain its efficiency and fit better with their new environment. This is known as the deliberate strategy (Mintzberg, 1978). Second, we expect a second organisational response, namely the emergence of a new organisational form that matches the changed environmental conditions more closely than that achieved by established organisational form. From the perspective of strategic management, such an organisational response is known as an emergent strategy (Mintzberg, 1978). Consequently, a third organisation response is required which is the reciprocal adjustment of the existing organisational form and the new organisational form through differentiation and integration. In addition to the reciprocal adjustment, the adapted condition and its accompanying processes and control mechanisms begin to feedback and reshape both the environmental conditions to guaranty the continuation of this co-evolutionary process of schemata when new information will be received.

Therefore we suggest that:

Design guideline 3a:
A stabilisation operation in dynamic equilibrium, driven by non-linear feedback controls adapts its initial organisational structure, processes and control mechanisms through well-defined hierarchical structures, rules and procedures to sustain its efficiency and fit better with their changing internal organisation and external environment.

Design guideline 3b:
A stabilisation operation in dynamic equilibrium, driven by non-linear feedback controls, enables the emergence of new organisational structures as well as types of behaviour that match the changed internal and environmental conditions more closely than that achieved by established organisational form.

Design guideline 3c:
A stabilisation operation in dynamic equilibrium, driven by non-linear feedback controls, enables the reciprocal adjustment of the existing organisational form and the new organisational form through differentiation and integration.

Design guideline 3d:
A stabilisation operation in dynamic equilibrium, driven by non-linear feedback controls, provides ground for the adapted organisational form and its accompanying processes and control mechanisms to feedback and reshape the environmental conditions in order to guaranty the continuation of this co-evolutionary process of schemata when new information will be received.

As in the first part of the model, this process is circular in its way that on one hand the participating systems absorb information derived from the exploration of the internal organisation, identify regularities and subsequently translate this information into adapted policy scenarios. On the other hand, the participating

systems absorb information derived from the exploration of the changed external environment, identify regularities and subsequently translate this information into adapted context scenarios. The combination of the adapted policy scenarios and contextual scenarios results in the adaptation of the strategic scenarios which provide an image of the whole. In sum, our co-evolutionary framework shows the fact that stabilisation operations should be considered complex open systems that continuously evolve as a result of the constantly changing environmental conditions.

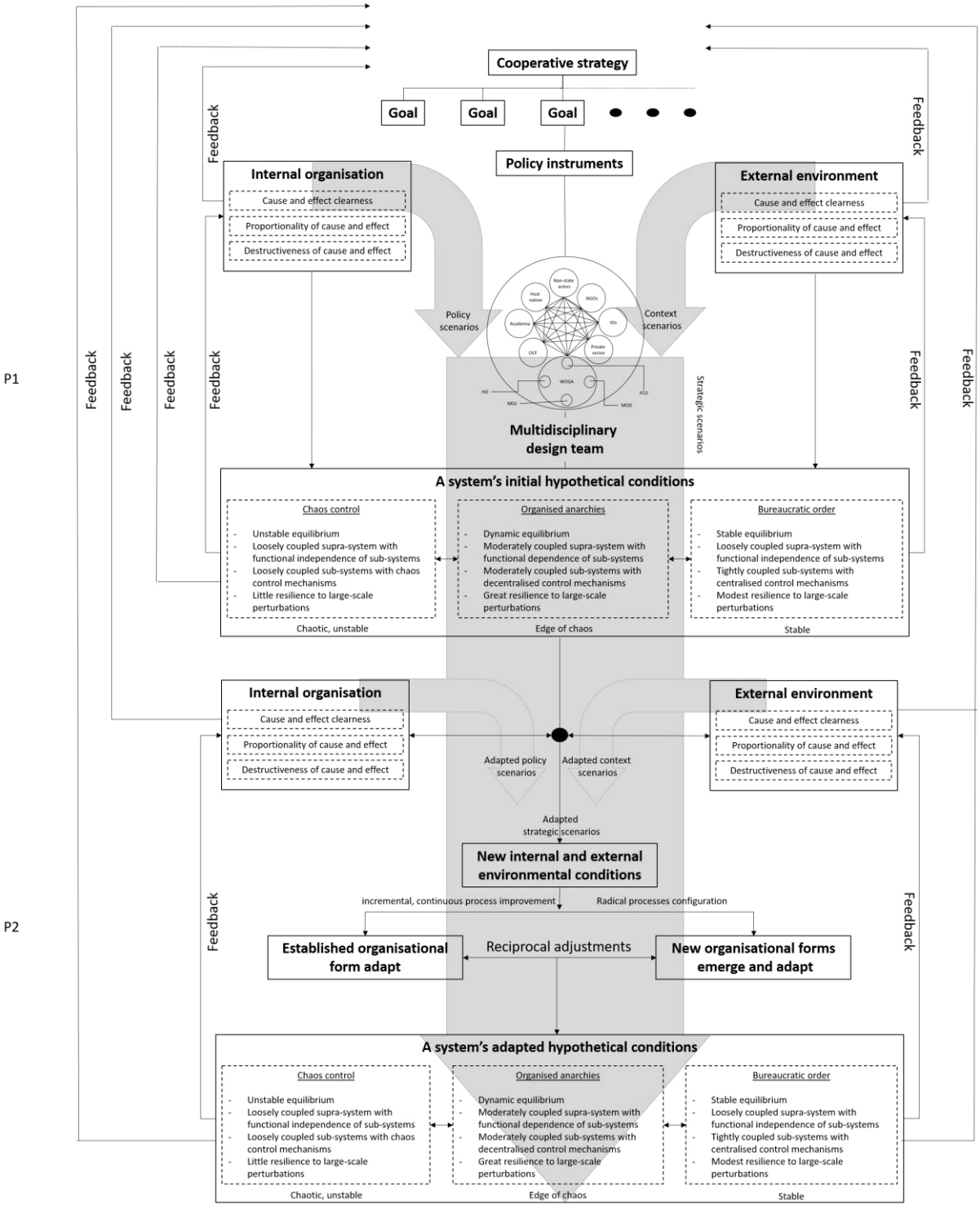


Figure 8.5: The co-evolution of stabilisation operations and their respective environments.

In the above section, we introduced three distinct forms of network organisation structure (i.e. hybridisation) which offer flexibility and adaptability while maintaining some hierarchical characteristics and centralised control. However, adapting to changing to changing environmental conditions requires more than a shift form classic hierarchical structures towards network design. Alberts and Hayes (2003) connect this rethinking of command and control to the Information Age where "control needs to be thought about and approached differently. Control is not something that can be imposed on a complex system, particularly when there are many independent actors. Control, that is, ensuring that behaviour stays within or moving to within acceptable bounds, can only be achieved indirectly. The most promising approach involves establishing, to the extent possible, a set of initial conditions that will result in the desired behaviour. In other words, control is not achieved by imposing a parallel process, but rather emerges from influencing the behaviours of independent agents" (p. 206-208).

Indeed, as demonstrated in this study, systems need to make a change from a functional- (or silo) to a process perspective. According to the literature, a process perspective enables management to avoid duplication of effort, improve communication and organisational processes (Pearlson and Saunders, 2009). More importantly, adapting to changing environmental conditions requires for stabilisation operations to build agile organisational processes or dynamic organisational processes. Agile processes, known for their incremental character, are purposefully designed with the intention adapt easily to the changing environmental conditions. Dynamic processes, by contrast, enable the reconfiguration of the various sub-systems within the supra-system through emergence and self-organisation (van der Aalst, 2003; Weber et al., 2007; Weske, 2012). Generally, agile and dynamic processes require substantial IS support (Pearlson and Saunders, 2009), something we will discuss below.

Generally, there are two techniques which could be used to create agile or dynamic processes, namely radical process redesign and incremental process improvement or adaptive (Mintzberg and Quinn, 1996) and ad hoc reactive (Mintzberg and Waters, 1985). Both techniques are equal from the perspective that they both provide ground for management to affect change by viewing an organisation as a bundle of organisational processes instead of applying a functional perspective (Davenport and Stoddard, 1994). Whereas incremental change is an approach in which management intent to change processes through small, incremental changes, radical change is concerned with the rapid attainment of more aggressive goals. Table 8.4 provides an overview of the key aspects of both techniques (Pearlson and Saunders, 2009).

Table 8.4: Key aspects of incremental and radical change processes. Source: adapted from Pearlson and Saunders (2009).

Incremental change	Radical change
Choosing a process to improve	The need for major change in a short amount of time
Choosing a metric by which to measure the process	Thinking from a cross-functional process perspective
Enabling personnel involved with the process to find ways to improve it based on the metric	Challenging old assumptions (i.e. strategic scenarios)
	Networked (cross-functional) organising

	Empowerment of individuals in the process
	Measurement of success via metrics tied directly to organisational goals and the effectiveness of the new processes

According to Pearlson and Saunders (2009) radical change approaches tend to be more effective when it comes to changing cross-functional processes. Reflecting on stabilisation operations we propose both incremental, continuous process improvement and radical process configuration to be a core competency which enhances their ability to adapt to the constantly changing situation. These two types of change processes are an important part of our co-evolutionary framework in which a bifurcation in the conditions between the established organisational form (i.e. driven by the formal organisation) and the emergence of a new organisational form (i.e. driven by the informal organisation) is expected. We propose that the established organisational structure adapts its processes and control mechanisms through well-defined hierarchical structures, rules and procedures to sustain its efficiency and fit better with their new environment. This should be realised by applying incremental, continuous process improvement. By contrast, we expect a second organisational response, namely the emergence of a new organisational forms that matches the changed environmental conditions more closely than achieved by established organisational form. A dynamic realised by applying radical process configuration (see figure 8.5 P2).

When implementing radical process configuration as a core competency one should keep in mind that this type of change typically face great internal resistance. Consequently, incremental and radical process configuration should be an integral part of the strategic scenarios developed by the multi-disciplinary design teams in order to gain support amongst the various systems involved.

Requirements to enable information processing. The requirement to change from a functional to a process perspective requires a solid strategic model which consists of a business strategy that is supported by a matching organisational strategy and information strategy. Indeed, both the TFU and UN MINUSMA failed to link their information strategy with their organisational and business strategy. Generally, this was due to insufficient mechanisms, processes, and resources such as interoperable Information and Communications Technology (ICTs). There's a need to make a distinction here between internal centralised information sharing (i.e. within the individual sub-systems), internal distributed information sharing (i.e. between the sub-systems of the TFU and UN MINUSMA) and external distributed information sharing (i.e. between the sub-systems of the TFU and UN MINUSMA and the other systems involved). While internal centralised information sharing was considered by all interviewees as sufficiently institutionalised, both internal distributed information sharing and external distributed information sharing was hampered by the absence of an ICT-architecture with access for all the sub-systems and was depending on the classification of the information.

In this section we intend to answer how IS could enable the multi-actor interaction during stabilisation operation by making the translation from information strategy to architecture to infrastructure. More

specifically, in this section we focus on identifying requirements that enable the internal distributed as well as external distributed information processing accordingly.

Since stabilisation operations are characterised by an environment which is highly uncertain and ambiguous, large amounts of information needs to be processed between the sub-systems and between the complex system and the other systems as part of the supra-system. Organisations that are characterised by their strong hierarchical structure find difficulty in processing such large amounts of information (Rietjens, et al., 2007). Consequently, new design strategies are to be adopted to effectively coordinate daily operations. Galbraith (1973) introduced two organisation design strategies to better deal with uncertainty. First, an organisation may act with the intent of reducing the amount of information being processed. Conversely, they may act to increase the volume of information processing. Van Creveld (1991) connects these findings to the Command and Control systems of military organisations by arguing that they need to make choice between the two design strategies to cope with uncertainty: "is to increase its information processing capacity, the other is to design the organisation, and indeed the task itself, in such a way as to enable it to operate on the basis of less information" (p. 269).

Following Van Creveld (1991), increasing an organisation's capacity to process information results in a multiplication of communication channels (both vertical and horizontal), in turn, resulting in the increase of the volume and complexity of the so-called central command & control structure. Reducing the amount of information being processed can be further divided into two distinct sub-design strategies: first, one could radically simplify the organisation by planning everything in the greatest detail followed by an extensive rehearsal of the actions planned for. Second, an organisation can be seen as a set of sub-systems, each performing a specific task. According to Van Creveld (1991), the latter has been proven to be more effective than the other two when organisations must cope with high-levels of uncertainty.

The integration of the various IS into a single, flexible system was the most mentioned business requirement mentioned by most interviewees. First, the multi-disciplinary design team conducts their analysis and preferably achieve some level of consensus in regards to a strategic model. Second, business requirements associated with each derived goal should be able to offer the team with a detailed insight of the designated tasks for IS to be conducted. Then governance mechanisms are defined which should allow for the distribution of information throughout the complex system. Governance mechanisms typically describes how the command & control of the IS is organised. The business requirements are then analysed in more detail and subsequently translated into concrete processes (e.g. data management and security management) as part of the architecture. Figure 8.6 provides an overview of the process from strategy to infrastructure.

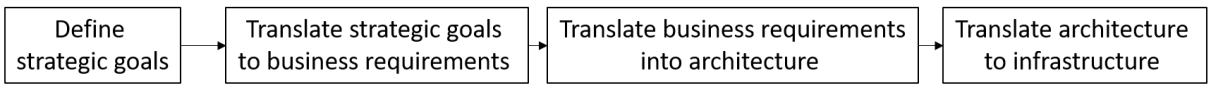


Figure 8.6: From strategy to architecture to infrastructure. Source: adapted from Pearlson and Saunders, 2009).

Detailed views of the business requirements and subsequent translation into infrastructure (e.g. lack of compatible hardware, data, networks and software) were mentioned as the reasons for the failure of the information strategy (Pearlson and Saunders, 2009). Reflecting on the data, IS infrastructure should focus on the inter-organisational level (i.e. the supra-system) by laying the foundation for communication within the individual system and between the various systems as part of the supra-system across systems boundaries. Ideally, an IS architecture and infrastructure should be realised by an independent actor in order to prevent actors from using such a system due to cultural differences, as stated by an information manager:

> "I do not think, how shall I say this, that one organisation should be responsible for this. Because if it is the MoD there are a number of NGOs which are not willing to corporate with them". (TFU HQ, R14).

According to most interviewees, classified information needs to be processed through encrypted ICTs. Consequently, the actors that did have access to such encrypted ICTs did not share classified information with those who were not authorised. Hence, information asymmetry between sub-systems with and without encrypted ICTs was created. By developing a single, flexible system developed by an independent actor also keeps us away from the issue related to the classification of information. However, we recognise that it is not feasible nor desirable for individual systems (particularly governmental actors) to declassify all the information available and share it amongst the other actors involved. Hence, like the organisational strategy, hybridisation should be the goal.

Traditionally, an IT architecture can be divided into three main configurations, namely centralised, decentralised, service-oriented and cloud (Pearlson and Saunders, 2009). A centralised architecture is characterised by support and management, typically in a data centre, in order to eliminate the complexities that characterise the management of a distributed infrastructure. This type of architecture, in which most of the hardware is connected to a single computer in order to establish a centralised hub that operates in accordance with the mainframe, is not a feasible or desirable solution for supporting an information strategy for stabilisation operations.

In a decentralised architecture, the basic components depend heavily on the network that connects them together. It operates by distributing information between the different ICTs. A decentralised architecture typically consist out of a number of servers that are operated from different geographical locations. The servers form the core of the infrastructure. This type of architecture better matches the desire to create a single, flexible system.

A third configuration is the service-orientated architecture. These are the systems we know from online employment forms or ticket processing services in which a limited number of functionalities are made available to many applications. This type of architecture is less feasible and desirable solution for supporting an information strategy of stabilisation operations.

We found that both the TFU and UN MINUSMA failed to link their information strategy with their organisational and business strategy. Generally, this was due to insufficient mechanisms, processes, and resources such as interoperable ICTs. Therefore, we asked the interviewees about how such type of architecture could be developed in order to support information processing amongst the systems involved. According to many interviewees, the notion of an open system accessible for all the systems as part of the supra-system is desirable. The suggestion was made to develop an open system based on the characteristics of a social media platform which should increase shared awareness in regards to demographic information, information about the terrain and information of other systems operating in the same operating environment. According to a CIMIC officer:

> "Various organisations naturally come to a lot of different places, and they all speak a lot with the population, which is always important to all of us. Having basic information about other organisations in the same area would already be a goal for such a system. Who is working there with what, contact information of the organisations and things like that, I can imagine that we want to swap such information together". (UN military staff, R11).

Finally, as we have learned throughout this study, an important aspect in regards to information processing is the classification of the information. Therefore, the desired architecture should be open to all participating systems and thus the information needs to be declassified. However, we acknowledge that it could be unfeasible or undesirable for (particularly) state actors to define all information available as unclassified. Hence, we need to think of an architecture that consist of multiple layers of architecture whereby only the unclassified information is stored in the first layer. As an information manager explained:

> "Improvised Explosive Devices or IEDs are commonly found in conflict situations. Once an IED is found by a military unit the location of that IED is marked and could be stored as unclassified information. Consequently this unclassified information is releasable amongst the systems involved. However, information on what specific type of IED was found should be classified on the IO level and therefore only IOs can access that information by using a second architecture. Even more specific information about which unit discovered the IED is even higher classified as secret information and is only accessible by military personal of the respective unit by using a third type of architecture". (TFU HQ, R13).

By using this multi layered-model of classification the actors involved in stabilisation operations should be able to cope more effectively with the hurdles for information sharing, distribute uncertainty throughout the complex system, and thus create enhanced shared awareness in a responsible way, which in turn, positively impacts their required self-organising ability to differentiate or integrate.

8.4 CONDITION-DEPENDENT CAPABILITIES

This section aims to answer the following sub-question:

Q3. How do stabilisation operations differentiate and integrate their sub-systems, organisational resources and competencies into condition-dependent capabilities?

Being responsive to changes in the environmental conditions requires systems to possess the ability to reconfigure the condition-dependent capabilities to compete to the constantly changing environment. The reconfiguration of capabilities is in the literature known as dynamic capabilities (Winter, 2003; Teece, 2007). Whereas the resourced-based-view (RBV) relates to the actual selection of resource combinations and their VRIN characteristics, dynamic capabilities are focused on the reconfiguration of resources into new combinations of operational capabilities to create sustainable competitive advantage (Pavlou and Sawy, 2012). In order to better understand the application of dynamic capabilities, we first need to present their differences compared to operational capabilities.

As we have described in chapter two of this study, capabilities refer the use and deployment of competencies in order to attain organisational objectives (McGrath et al., 1995; Teece et al., 1997). In this study, we use the definitions given by Pavlou and Sawy, 2012) to illustrate the distinction. Operational capabilities are "the ability to execute day-to-day activities" whilst dynamic capabilities are defined "as those capabilities that help units extend, modify, and reconfigure their existing operational capabilities into new ones that better match the changing environment" (p. 242). Connecting these definitions to our co-evolutionary framework, operational capabilities would focus on the established organisational form which adapts its processes and control mechanisms through well-defined hierarchical structures, rules and procedures to sustain its efficiency, whereas dynamic capabilities would focus on the emergence of new organisational forms that match the changed environmental conditions more closely than achieved by established organisational form (see figure 8.7).

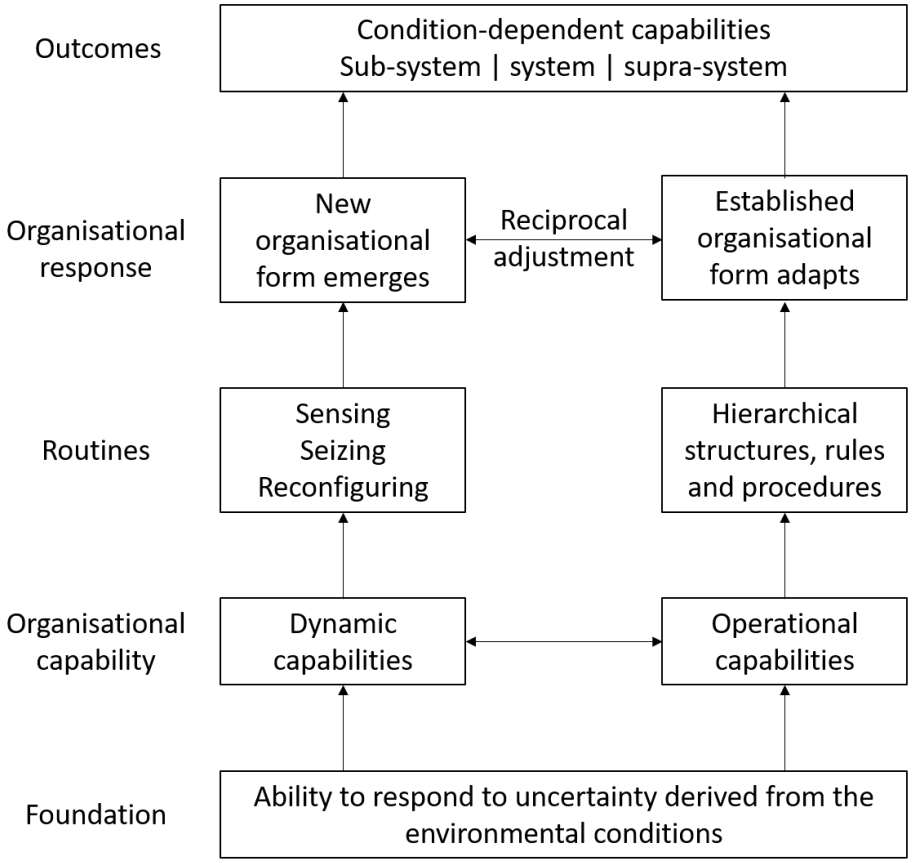


Figure 8.7: Understanding condition-dependent capabilities in the context of stabilisation operations.

According to Eisenhardt and Martin (2000) "dynamic capabilities actually consist of identifiable and specific routines that often have been the subject of extensive empirical research in their own right" (p. 1107). Teece (2007) proposed a set of distinct dynamic capabilities (see table 8.5), namely sensing, seizing and reconfiguring capabilities to explain how organisations may dynamically adapt and align their routines and resources to achieve competitive advantage which are extremely useful to add to our final model. In strategic management literature this is also known as an emergent strategy (Mintzberg, 1978).

Table 8.5: Definitions of three distinct dynamic capabilities.

Capability	Definition	Basic routines
Sensing capability	Observation and orientation of an actor's (or system) its environment (i.e. external), its situation within it (i.e. internal organisation), and the actions of the other actors (or systems) involved.	Observation, Orientation, Decision, Action (Boyd, 1986)
Seizing capability	The ability to reconfigure system capabilities with new knowledge to meet the requirements of their respective condition.	Creating new schemata (Gell-Mann, 1994)
Reconfiguring capability	Reconfiguring system capabilities in such a way that they meet the requirements of their condition could result in a	Reconfiguration of logic and patterns of interaction between systems to allow emergent supra-system

	state of integration and hence emergent (system) capabilities.	capabilities to arise (Crowston & Kammerer, 1998; Orlikowski, 2000).

The proposed dynamic capabilities are presented as important enablers to reconfigure the condition-dependent capabilities to keep them relevant to the constantly changing conditions through incremental or radical change processes, as described in detail below.

Sensing. From a business perspective, reconfiguration can be enabled by applying surveillance over emerging markets and technology (Pavlou and Sawy, 2011). According to Teece et al. (1997) "the ability to calibrate the requirements for change and to effectuate the necessary adjustments would appear to depend on the ability to scan the environment, to evaluate markets and competitors, and to quickly accomplish reconfiguration ahead of competition" (p. 521). For the purpose of this study the basic routines of sensing capability are observation, orientation, decision, action (Boyd, 1986). We suggest reconfiguration requires observation and orientation of an actor's (or system) its external environment, its situation within it (i.e. internal organisation), and the actions of the other actors (or systems) involved to sense and seize opportunities and threats, and identify potential responses. In this phase individual actors (or system) absorb information from its environment conditions and analyses this accordingly. In the decision phase the actor(s) involved select a suitable course of action (based upon the previous observation and orientation phase) which is subsequently carried out in the action phase.

Seizing. The above described process is circular in its way that during the observe-orient-decide-act process new information received from the interaction with the environmental conditions is included. Moreover, the process is highly non-linear and thus feedback loops exist between all four basic routines of sensing capability. As a result, the analytical framework described in the orientation phase could potentially be modified through new observations of an actor's (or system) external environment, its situation within it, and the actions of the other actors (or systems) involved. Boyd (1986) makes a distinction between two fundamental processes within the orientation phase, namely analyses and synthesis (i.e. creating new schemata when the previous schema becomes obsolete). Hence, sensing and seizing are distinct dynamic capabilities since sensing focuses on the development of schemata while seizing focuses on learning from previous experiences and adapt the schema with new knowledge when it becomes obsolete. It is argued that seizing facilitates reconfiguration and innovation processes (Van den Bosch et al., 1999). Accordingly, we view seizing capability as the possibility to reconfigure systems capabilities in such a way that they meet the requirements of their respective condition.

Reconfiguring. Reconfiguring system capabilities in such a way that they meet the requirements of their condition could result in a state of integration by design or through emergent capabilities. According to Okhuysen and Eisenhardt (2002) this demands for shared interaction patterns. In this study, we view emergent supra-system capabilities as those capabilities that neither sub-system possesses individually nor that are modified as a result of the integration. Therefore, individual systems integrate their logic and

patterns of interaction with those of other systems in order to allow emergent supra-system capabilities to arise (Crowston & Kammerer, 1998). In other words, reconfiguration represents how systems capabilities fit together or are in alignment to execute collective activities to meet the requirements of their condition. According to Weick and Roberts (1993) groups with a high-level of integration may better respond in complex situations. Therefore, we expect that within the organised anarchies systems are most likely to interact with each other, that is, be compatible.

The reconfiguration of system capabilities adjusted to its specific condition requires effective coordination (Peterson et al., 2000). Coordination is defined by Peterson et al. (2000) as "the timely and purposeful adjustment of decisions pertaining to values of different aspects, between stakeholders involved in decision making" (p. 436). More specifically, coordination is the orchestration of collective tasks, resources and activities (Henderson and Lentz, 1994; Brown and Eisenhardt, 1998). We propose coordination as an important facilitator for the *ex-ante* assessment. First, it enables individual systems to identify, gather and allocate resources that fits its specific condition. This can be done through sensing and seizing (i.e. dissemination of the interpretation of the information collected and making sense of the situation observed). Second, coordination leads to better synchronisation of efforts thereby preventing duplication of effort. Third and according to Quinn and Dutton (2005), "coordination is the process people use to create, adapt, and re-create organizations" (p. 36). Accordingly, one would expect better coordination to take place in the organised anarchies.

Taken together, we suggest the following:

Design guideline 4:
A system capable to respond to changing environmental conditions requires the self-organising ability to differentiate and integrate its sub-systems through the application of dynamic capabilities, which in turn, positively impacts the development and reconfiguration of condition-dependent capabilities.

8.5 OUTCOMES

This final section aims to provide answer the following sub-question:

Q4. How do condition-dependent capabilities positively influence the attainment of outcomes?

As we have learned throughout this study, stabilisation operations often face situations or problems that are characterised by their unclear nature. Therefore, we have introduced problem exploration activities in order to define an unambiguous formulation of the situation or problem. Once a specific situation or problem has been clearly identified, mapping the causal relationships (i.e. what factors cause the situation or problem) becomes feasible. As we have introduced in the above section, the actors of the systems involved in stabilisation operations ideally begin with a cooperative strategy (the 'why'), which is subsequently translated

into specific goals. Then various possible policy instruments (i.e. MEANS) to influence the supra-system, improving the degree to which the determined goals may be realised should be described in various policy scenarios (i.e. WAYS or the 'how'). The realisation of goals (i.e. a certain desired situation) is typically formulated in the form of end-states (ENDS) which, in turn, are measured through the use of criteria (Walker, 2000). However, in stabilisation operations the actors involved hold different perceptions in regard to both the existing or expected situation (characteristics, consequences, causes and possible solutions) and the desired situation or outcomes (i.e. end-states). Moreover, according to many respondents identifying cause and effect relationships or outcomes is very difficult. Even when it was possible to determine a certain outcome, it often was impossible to identify what had caused that outcome. This is mainly due to the interconnectedness and nonlinear relationships in the complex system.

Therefore, a qualitative analyses (i.e. strategic scenarios) conducted by a multi-disciplinary design team of what should be achieved, including the perceptions of all the participating actors, should provide a clear picture of what the individual systems want to accomplish is essential to close this gap. A suitable method for describing potential solutions is a MEANS-ENDS diagram. With this MEANS-ENDS diagram, members of the multi-disciplinary design teams present various MEANS-ENDS to formal decision-makers in order to include these policy outputs in decision-making and close the gap in regards to the difference between the perception of policy outputs and policy impacts.

Linear thought processes suggest that supporting organisations such as Western IOs, NGOs and private firms can design a blueprint for the stabilisation and recovery of a post-conflict zone from INPUT to OUTPUT. On the contrary, complex systems thinking tells us that that the output (i.e. realised strategy) of the supporting organisations cannot be understood in isolation from organisations and societies such as the host nation and local actors who they intent to support. In complex systems language we would say that we cannot explain the behaviour of the whole system by analysing its individual sub-systems.

Accordingly,

Design guideline 5:
Although the development of condition-dependent capabilities positively impacts the attainment of policy outputs, policy impacts remain hard to identify and measure due to the interconnectedness and nonlinear relationships in the complex system.

8.6 CONCLUSION

In sum, differences in problem perception and the expected situation (i.e. ENDS) perfectly illustrate the different types of uncertainty that impact the predictability of stabilisation operations as complex systems, in turn influencing the multi-actor interaction during such missions. Particularly, impact uncertainty, modelling uncertainty, uncertainty about relations between actors, combined with environmental

uncertainty results in uncertainty about outcomes. Most of these uncertainties only become observable once a stabilisation operation deploys and therefore automatically became part of a supra-system (e.g. IOs, NGOs, local, population, host nation government and the private sector). As a result, we view stabilisation operations as a complex systems with a sensitive dependence on its initial conditions and, once deployed and thus part of a supra-system, of which the effectiveness of the strategic model depends inherently on its ability to respond to changing environmental conditions.

Having all the above summarised and discussed with the *ex-post* interviewees, we suggest the following answer to the main research question of this study:

> ***How to better cope with the complexity of multi-actor interaction during stabilisation operations, and how does information processing enable this interaction?***
>
> ***The strategic model of stabilisation operations needs to make a shift from its focus on ENDS, towards one which provides ground for an inherent order that identifies and models a system's overall behaviour through adapted and acceptable WAYS. In other words, the strategic modelling of stabilisation operations is subject to change.***

In figure 8.8 we present our final conceptual model, including the influence of the uncertainty derived from the environmental conditions on the initial conditions and intended strategy of stabilisation operations (P1) followed by the co-evolutionary framework which illustrates a system's self-organising ability (i.e. emerging strategy) to respond to changing environmental conditions and by taking on an adapted condition and reconfigure the condition-dependent capabilities to keep them relevant to the constantly changing conditions (P2). We conclude our final model to illustrate the impact of the condition-dependent capabilities on the policy outputs and ultimately policy impacts as part of the realised strategy (P3).

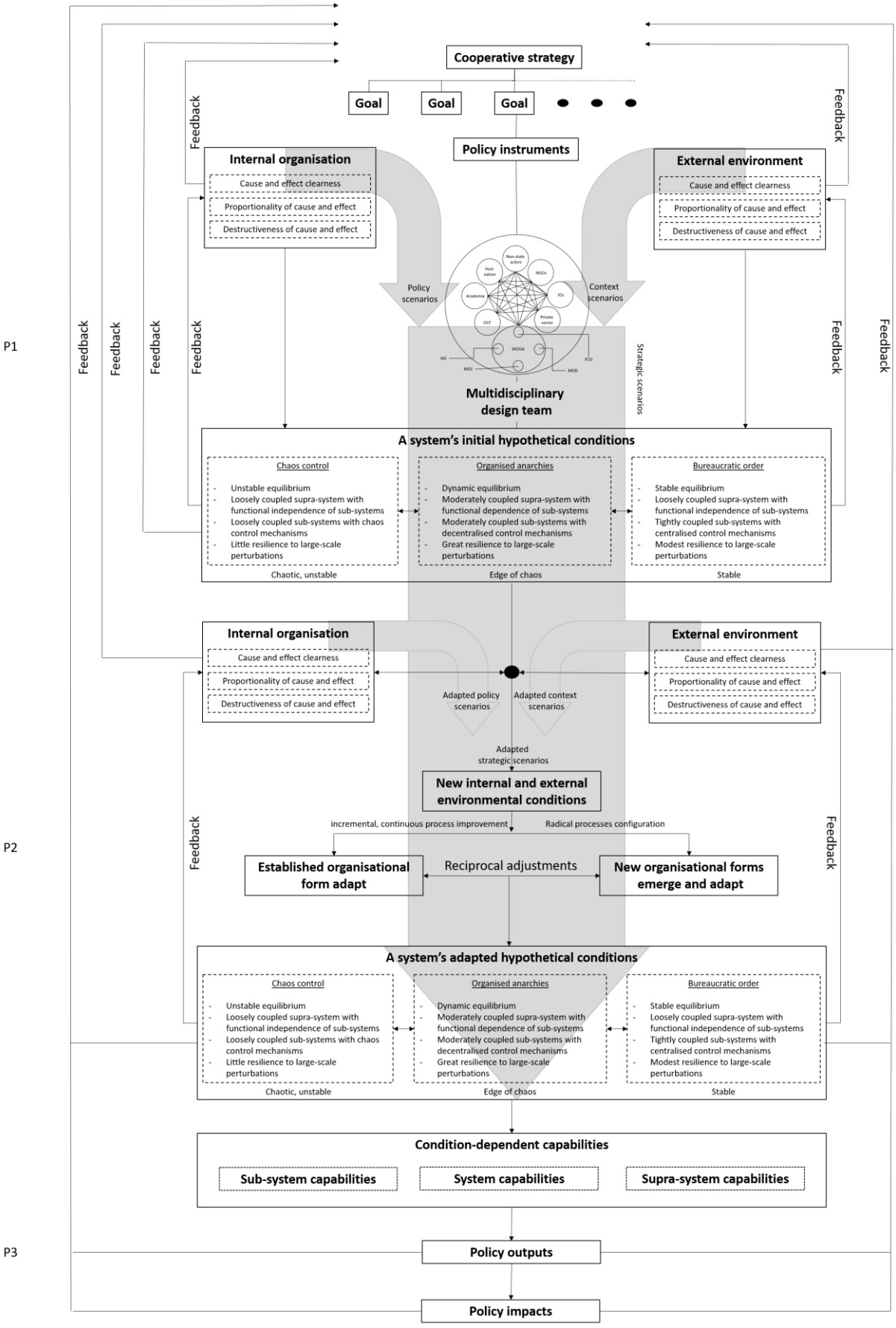


Figure 8.8: Complex modelling tool for stabilisation operations.

9

Contributions, limitations and conclusions

"I not only think but also look and study things carefully. When I travel around, I look at things carefully, make comparisons of what I see. I don't accept things at face value, you cannot trust what you hear or see. Don't jump to conclusions without thinking".

- *Mahathir Mohamad (2013)*

9.1 INTRODUCTION

This concluding chapter summarises this study and provides insights regarding the research contributions to both theory and practice. The outcomes of this study are grounded in the results of the literature review (Chapter 2), development of the initial conceptual model (Chapter 3), two case studies (Chapter 5 and 6), cross-case analysis (Chapter 7) and development of the final conceptual model (Chapter 8).

This chapter proceeds as follows: section 9.2 discusses the contributions of this study for both academics and practitioners. In section 9.3 we discuss the limitations of this study and provide possible directions for future research. This chapter concludes with a brief reflection whether the findings of this study fulfils the research aim by answering the two main research objectives.

9.2 RESEARCH CONTRIBUTIONS

This study has two main objectives. We first aim to understand the impact of uncertainty derived from the environmental conditions on stabilisation operations as complex systems and the subsequent influence on their required self-organising ability to apply differentiation and integration. Second, we explore the role of information processing as a key organising concept through which the self-organising system differentiates and integrates its sub-systems, resources and competencies into condition-dependent capabilities.

By presenting our final conceptual model we aim to provide guidance on the following elements for the organisational design of stabilisation operations:

1. The impact of the environmental conditions on the condition of stabilisation operations.
2. The application of non-linear feedback controls as a response to the complexity of the environmental conditions.
3. The role of information feedback in the reconfiguration of condition-dependent capabilities to keep them relevant to the constantly changing environmental conditions.

4. The impact of the condition-dependent capabilities on the policy outputs and ultimately policy impacts.

Hence, this study contributes both conceptually, empirically and practically to the organisational design of stabilisation operations which deals with the complexity of multi-actor interaction.

9.2.1 Contributions to theory

Literature on strategic thinking of stabilisation operations is rich and includes different distinct research streams. The dominant research stream applied to this study is that of the organisational design of stabilisation operations. The stream of organisational design focuses on strengthening coordination and integration efforts amongst the various actors involved in stabilisation operations (Patrick and Brown, 2007; De Coning and Friis, 2011; Schnaubelt, 2011; Smith, 2012). Additionally, although stabilisation operations have always been structurally complex (De Coning, 2016), they were commonly organised following a general and structured input-process-output organisational model that was applicable to different operations (Ramalingam, 2013; ADDP, 2014; Chandler, 2016).

However, one of the primary lessons learned from the interventions in the Former Yugoslavia, Iraq and Afghanistan was that conventional modelling tools are not able to cope with the complexity of stabilisation operations since different types of uncertainties impact the predictability of a system's condition, in turn influencing the multi-actor interaction during stabilisation operations (Manning, 2003; Rathmell, 2005; Paris, 2009; De Coning, 2016). Therefore, this study introduces complex systems as an alternative for the strategic modelling of stabilisation operations and supports the debate over the extent to which integration is feasible and desirable.

Stabilisation operations and organisational design theory. As discussed in chapter 2, most literature on stabilisation operation focuses on the successful integration of IOs, Non-Governmental Organisations (NGOs), host nation governments, local actors both state and non-state as well as the private sector (Dutch Ministry of Defence, 2000; De Coning and Friis, 2011; Zelizer et al., 2013; Chandler, 2016). However, an integrated or comprehensive approach to stabilisation operations can be applied to the many civilian and military actors involved, across various sectors, and at various levels, aimed at creating peace, security and stability in a certain geographical area, country or region throughout the whole spectrum of conflict. As a result, multi-actor interaction occurs over a broad range of issues, take place under complex and uncertain conditions, with each interaction following its own pace dictated by its specific conditions. Hence, stabilisation operations can be understood as an organisational system that is formed around various sub-systems which interact in a non-linear fashion. Interactions in a non-linear fashion are defined as "complex" (Perrow, 1972; Waldrop, 1992; Capra, 1997). Thus, stabilisation operations can be viewed as complex systems. As a result, we subsequently introduced literature on systems theory and more specifically complexity theory to illustrate the connection between complex systems thinking and the organisational design of stabilisation operations. Combining the two theories allows us to offer three contributions in the

field and illustrates the proposed alternative way of thinking which is characterised by the non-linear sciences.

The first is support for the discussion within organisational design theory that uncertainty is caused by factors derived from the external environment. Most of the literature on organisation design argues that complexity, unpredictability, and instability of the external environment seems to have outpaced traditional organisation design approaches and concepts (Duncan, 1972; Daft and Lengel, 1986; Worley and Lawler, 2010). Connecting these arguments to systems thinking we find that a system is defined as a closed system when it is in a state of being isolated from its environment and operates deterministically, while open systems are characterised by a certain degree of interaction with their environment and operate most probabilistically (Wiener, 1948; Von Bertalanffy, 1968). Indeed, the empirical findings in this study suggest that stabilisation operations take place in a highly complex, dynamic and uncertain environment from which it cannot be isolated, thereby influencing a system's condition from outside the system's boundary (i.e. the external environment). In other words, stabilisation operations are impacted by environmental uncertainty (that is: unpredictable events and factors beyond control)

The second contribution is the support for the underexposed discussion within organisation design theory that uncertainty is caused by factors derived from the internal organisation. The empirical findings in this study suggest that stabilisation operations require a highly differentiated as well as integrated organisational system with interaction between the actors of its sub-systems. These interactions occur over a broad range of issues, take place under complex and uncertain conditions, with each interaction following its own pace dictated by its specific conditions. Hence, stabilisation operations can be understood as an organisational system that is formed around various sub-systems which interact in a non-linear fashionm, in turn influencing a system's condition from inside the system's boundary (i.e. the internal organisation). In other words, stabilisation operations are impacted by uncertainty derived from the relations between actors. In sum, stabilisation operations are heavily impacted by the uncertainty derived from the internal organisation as well as the external environment resulting in the dynamic equilibrium conditions of the complex system.

The third contribution in the field relates to the conceptualisation of a system's condition which deals better with its dynamic equilibrium. To provide a more detailed conceptualisation of a system's condition we applied the Cynefin framework (Snowden, 2002). The framework (see figure 3.4) consists of three main domains (i.e. ordered, unordered and disordered) that reflect different relationships between causes and effects and derivative ways of practices. For every domain, the framework presents a different form of behaviour which then implies for different forms of connections. Applying the Cynefin framework to the findings of the case studies turned out to be a valuable tool to better comprehend and frame non-linear interactions. Based on our findings, we introduced an adapted framework which consists of three specific situations that better match the specific condition of stabilisation operations and which describes three hypothetical initial conditions (see figure 7.5) and derived organisational strategies, namely bureaucratic order, organised anarchies and chaos control as metaphor to illustrate the hybrid organisational strategy

which allows greater flexibility, lateral connectivity, coordination and cooperation between the many actors, enabling and supporting emergence in relationship to the dynamics of governance. When we connect this to Mintzberg (1978) we find that our results connect very closely to his explanation of emergent strategy.

Stabilisation operations and complex systems thinking. This study connects stabilisation operations with complex systems thinking (Gell-Mann, 1994; Holland, 19995; Capra, 1997) which enables our study to offer several distinct contributions to the field. The first is the support for the recognition that stabilisation operations are characterised by their sensitive dependence on initial conditions. As we have described above, stabilisation operations operate in dynamic equilibrium (i.e. stable equilibrium through negative feedback controls or far from equilibrium through positive feedback). Because of this non-linearity, complex systems are highly sensitive to their initial conditions (Holland, 1995; Stewart, 2000). This phenomenon can be best explained through the non-proportionality of the cause and effect relationships (i.e. asymmetrical input to output) that characterise open systems. In other words, even the smallest changes to a system's initial condition may result in large-scale alterations in its future way of behaving. A system's sensitive dependence on the initial conditions is popularly known as the "butterfly effect" which is a metaphor for the question whether "the flap of a butterfly's wings in Brazil doe set off a tornado in Texas" to illustrate the complexity and unpredictability of weather systems (Lorenz, 1972, p. 181).

Indeed, the empirical findings in this study suggest that stabilisation operations initial conditions are heavily influenced by impact uncertainty (i.e. sensitive dependence on initial conditions and *equifinality*) due to four distinct types of uncertainty, namely modelling uncertainty (imprecise knowledge on how to control input), uncertainty about relations between actors, environmental uncertainty (i.e. unpredictable events and factors beyond control) and uncertainty about outcomes. As a result, our findings suggest that the strategic modelling of stabilisation operations should be a probabilistic process that provides ground for an inherent order that identified and modelled the system's overall behaviour through adapted and acceptable WAYS. These findings are contrary to opinion prevalent within the field which stresses that in order to achieve its mission, stabilisation operations need to set clear, tangible and measurable ENDS (i.e. objectives, performance targets) that should be achieved by suitable MEANS through determined WAYS (Farrell et al., 2013; Grandia, 2015; Kitzen, 2016).

Combining the two theories resulted in a second contribution. Although the impact uncertainty and environmental uncertainty imposes a limitation on the predictability of stabilisation operations as complex system, it simultaneously revealed that certain ENDS may be the result of WAYS that started from different initial conditions as these differences could be amplified through positive feedback controls. This is known as the *equifinality* of open systems (Gleick, 1987; Prigogine, 1997).

These characteristics of complex systems lead to many analytical challenges and implications to develop or simulate such a model. In contrast to the Newtonian paradigm, which traditionally focused on gaining a full and comprehensive understanding of a system, complex systems thinking allows for a more qualitative understanding of the cognitive processes and recognising information processing as the key operating

process through which these systems (i.e. organisations) adapt and self-organise their sub-systems, organisational resources and ultimately co-evolve using schemata. However, the conceptualisation of information processing as the key operating process remains quite abstract this far. To have a better understanding of this we connected the theory on stabilisation operations and complex systems thinking with the literature on information processing, distribution and exchange.

Stabilisation operations and information processing theory. Following information processing theory (Galbraith, 1973), the level of uncertainty and the volume of information that needs to be distributed are regarded as a cause and effect relationship. Thus, organisations that face considerable uncertainty require considerable amounts of information to be processed. Since stabilisation operations are characterised by an environment which is highly uncertain and ambiguous, large amounts of information needs to be processed between the various sub-systems as well as between multiple complex systems as part of the supra-system. Organisations that are characterised by their strong hierarchical structure find difficulty in processing such large amounts of information (Rietjens, et al., 2007).

Indeed, the empirical findings in this study suggest that even though stabilisation operations are characterised by an environment which is highly uncertain and ambiguous, both internal and external information processing was hampered due to the organisational structure of the mission. Our findings indicate that information sharing between different sub-systems can be hindered due to differences in norms, values, beliefs, mandates, processes and expectations. Moreover, in bureaucratic organisations such as NATO and the UN, command & control are centralised at the higher levels of an organisation. As a result, (the speed of) information sharing could be impeded since decision rights are held at the top of an organisation, a characteristic which relates closely to the formal system of an organisation (Kim and Lee, 2006). Consequently, new design strategies should be adopted to effectively coordinate daily operations.

In order to do so we added a co-evolutionary framework to our final model (see figure 7.6 – P2). After the initial design process in which the strategic modelling ideally is developed by a multidisciplinary design team, the systems involved take the form of one of the three presented initial conditions and calibrate their organisational form and derived control mechanisms accordingly to fit best the most likely environmental conditions. It is important to note that this selected initial condition constitute an influence on the constantly changing environment to which the system has adapted (Baum and Singh 1994). To put it differently, while a stabilisation operation adapts to its respected environment it simultaneously shapes this same environment since the output produced has a certain effect. From an organisational perspective, the formal organisation (focusing on executing daily operations as efficiently as possible in order to maintain goal attainment of the systems should be driven by negative feedback which generates stable behaviour. By contrast, the informal organisation (a network of interpersonal relationships focusing on norms, values and beliefs) of the systems may be driven by positive feedback controls which generates stable behaviour. Thus, stabilisation operations should be driven by non-linear dynamics to maintain a certain level of control while simultaneously enabling emergence and self-organisation.

Once the selected condition is influenced by changes derived from the internal organisation and external environment, it should seek to adapt and calibrate its organisational structure and derived control mechanisms to fit better with its new environmental conditions. Our co-evolutionary framework expects a bifurcation in the conditions between the established organisational form (i.e. driven by the formal organisation) and the emergence of a new organisational form (i.e. driven by the informal organisation). First, we propose that the initial established organisational structure adapts its processes and control mechanisms through well-defined hierarchical structures, rules and procedures to sustain its efficiency and fit better with their new environment. Second, we expect a second organisational response, namely the emergence of a new organisational form that match the changed environmental conditions more closely than that achieved by established organisational form. Consequently, a third organisation response is required which is the reciprocal adjustment of the existing organisational form and the new organisational form through differentiation and integration. In addition to the reciprocal adjustment, the adapted condition and its accompanying processes and control mechanisms begin to feedback and reshape the environmental conditions the adapted condition and its accompanying processes and control mechanisms begin to feedback and reshape both the environmental conditions to guaranty the continuation of this co-evolutionary process of schemata when new information will be received.

Stabilisation operations and strategic management theory. Finally, this study contributes to the strategic management literature. Adapting to changes in the environmental conditions requires systems to possess the ability to reconfigure the operational capabilities to keep them relevant to the constantly changing environmental conditions. The reconfiguration of capabilities is in the literature known as dynamic capabilities (Winter, 2003; Teece, 2007). To better understand the application of dynamic capabilities, there is a need to clarify their differences from operational capabilities.

Although operational capabilities and dynamic capabilities are a collection of routines there is a clear distinction between both. Operational capabilities are defined as "the ability to execute day-to-day activities" whilst dynamic capabilities are defined "as those capabilities that help units extend, modify, and reconfigure their existing operational capabilities into new ones that better match the changing environment" (p. 242). Connecting these definitions to our co-evolutionary framework, operational capabilities would focus on the established organisational form which adapts its processes and control mechanisms through well-defined hierarchical structures, rules and procedures to sustain its efficiency, dynamic capabilities would focus on the emergence of a new organisational forms that matches the changed environmental conditions more closely than that achieved by established organisational form.

Teece et al. (1997) proposed a set of distinct dynamic capabilities (see table 7.5), namely sensing, seizing and reconfiguring capability as tools for the reconfiguration of operational capabilities. This set turned out to be very helpful to add to our final conceptual model. This study confirms that the dynamic capabilities presented by Teece (1997) is indeed important to keep the operational capabilities relevant to the constantly changing conditions by reconfiguring them through incremental or radical change processes. Interestingly,

this study intents to make a modest contribution to the strategic management literature by introducing the reconfiguration of sub-system, system and supra-system capabilities through self-organisation as condition-dependent capabilities (i.e. new organisational forms emerge and adapt). Sub-system capabilities are the high-level routines that are formed through the relationships between the organisational resources and competencies from a single sub-system. In other words, a single system is differentiated into several distinct sub-systems. System capabilities are the high-level routines (or a collection of routines) that are formed through the relationships between the organisational resources and competencies of multiple sub-systems. Hence, a single system is integrated. Supra-system capabilities are the high-level routines (or a collection of routines) that are formed through the relationships between organisational resources and competencies from two or more systems, that is, they are integrated.

9.2.2 Contributions to practice

The paradox between the linear logic of an integrated and comprehensive approach and the complexity of stabilisation operations, and between stabilisation operations and its environment echoes the purpose of this study: offering complex systems thinking as an alternative for the strategic modelling of stabilisation operations and supporting the debate over the extent to which integration is feasible and desirable. The fact that both participants as well as the researcher involved in the case studies are practitioners is considered to be of high value. Accordingly, although the aim of this research is in nature theoretical, offering a new reading for strategic thinking of stabilisation operations by introducing complex systems thinking as the steering mind-set to cope more effectively with the complexity of multi-actor interaction during stabilisation operations, it is embedded in practice, designating a key role in the presentation of the results to practitioners.

Coping with uncertainty. The findings of this research indicate that an investment in the application of methods for exploring uncertainty derived from the environmental conditions - which could be extremely useful to evaluate whether the system's demarcation (i.e. system's boundary) and its environment are right and whether all relevant actors and factors (i.e. types of uncertainty) are included in the right way – is very useful. Moreover, exploration clarifies the distinction between the selection of policy instruments (MEANS) and uncertainties form outside the system's boundary, and how they influence (via causal relations) the effectiveness of exploration as a policy instrument, ultimately enabling the determination of a system's condition. Applying methods for exploration, and particularly scenarios, has the goal to contribute to policy forming and system's design. These methods are an instrument of analysis that can be used to challenge the many actors involved in stabilisation operations to co-think *ex-ante* about the exploration of the identified types of uncertainty and their impact on the initial conditions of stabilisation operations as complex system. Additionally, these methods should be used to co-design images of the possible (current and future) scenarios to enable the development of condition-dependent capabilities. Most importantly, applying these methods have the potential to enlarge the support of the stabilisation mission itself. Consequently, this study recommends that exploring uncertainties should be employed by multidisciplinary design teams which

preferably include actors of the respective systems, who, in the course of the design process, put forward their ideas and results several times to a broad forum of other creative and critical experts. By doing so, the actors involved are able to intentionally choose for an integrated or differentiated design with the appropriate governance arrangements.

Organisational adaptability. The above recommendations regarding exploration suggests that the uncertainty derived from the internal organisation and external environment and their impact on a system's condition are linear. On the contrary, a specific factor may emerge weakly and grow in strength over time until a response from the system is initiated. The response to a specific factor could emerge as an incident or as a point of evolutionary punctuation which could change the impact on or bring about discontinuous change to other factors. In other words, the very nature of the uncertainties derived from the internal organisation and external environment is continuously nonlinear and thus makes prediction impossible. This dynamic has severe implications on the planning of stabilisation operations since this needs to be based on assumptions instead of facts. Indeed, the effectiveness of stabilisation operations depends, apart from the development of strategic scenarios, mainly on their adaptability to the constantly changing environmental conditions.

To illustrate the organisational adaptability of stabilisation operations we added a co-evolutionary framework to our final model. After the initial design process in which the strategic scenarios ideally are developed by a multidisciplinary design team the systems involved take the form of one of the three presented initial conditions and calibrate their organisational form and derived control mechanisms accordingly to fit best the most likely strategic scenario. It is important to note that this selected initial condition constitute an influence on the constantly changing environment to which the system has adapted. To put it differently, while a stabilisation operation adapts to its respected environment it simultaneously shapes this same environment since the output produced has a certain effect. Once the selected condition is influenced by changes derived from the internal organisation and external environment, the complex system should seek to adapt and calibrate its organisational structure and derived control mechanisms to fit better with its new environmental conditions. Our co-evolutionary framework expects a bifurcation in the conditions between the established organisational form (i.e. driven by the formal organisation) and the emergence of a new organisational form (i.e. driven by the informal organisation). First, we propose that the initial established organisational structure adapts its processes and control mechanisms through well-defined hierarchical structures, rules and procedures to sustain its efficiency and fit better with their new environment. Second, we expect a second organisational response, namely the emergence of a new organisational form that matches the changed environmental conditions more closely than that achieved by established organisational form. Consequently, a third organisation response is required which is the reciprocal adjustment of the existing organisational form and the new organisational form through differentiation and integration. In addition to the reciprocal adjustment, the adapted condition and its accompanying processes and control mechanisms begin to feedback and reshape both the environmental

conditions to guaranty the continuation of this co-evolutionary process of schemata when new information will be received.

Steering mind-set. Adapting to changes in the environmental conditions requires more than a shift form classic hierarchical structures towards network design. Indeed, as demonstrated in this study systems need to change from a functional to a process perspective. Adapting to changes in the environmental conditions demands stabilisation operations to build agile and/or dynamic organisational processes. Agile processes, known for their incremental character, are purposefully designed with the intention adapt easily to the changing environmental conditions. Dynamic processes, by contrast, enable the reconfiguration of the various sub-systems within the supra-system through emergence and self-organisation (van der Aalst, 2003; Weber et al., 2007; Weske, 2012).

Generally, there are two techniques which could be used to create agile or dynamic processes, namely radical process redesign and incremental process improvement (examples are for instance total quality management (TQM) and Six Sigma). Both techniques are equal from the perspective that they both provide ground for management to affect change by viewing an organisation as a bundle of organisational processes instead of applying a functional perspective (Davenport and Stoddard, 1994). Whereas incremental change is an approach in which management intent to change processes through small, incremental changes, radical change is concerned with the rapid attainment of more aggressive goals.

Reflecting on stabilisation operations we propose both incremental, continuous process improvement and radical process configuration to be a core competency to enhance their ability to respond better to the constantly changing situation. These two types of change processes are an important part of our co-evolutionary framework in which a bifurcation in the conditions between the established organisational form (i.e. driven by the formal organisation) and the emergence of a new organisational form (i.e. driven by the informal organisation) is expected. We propose that the established organisational structure adapts its processes and control mechanisms through well-defined hierarchical structures, rules and procedures to sustain its efficiency and fit better with their new environment. This should be realised by applying incremental, continuous process improvement. By contrast, we expect a second organisational response, namely the emergence of a new organisational forms that matches the changed environmental conditions more closely than that achieved by established organisational form. This should be realised by applying radical process configuration.

When implementing radical process configuration as a core competency one should keep in mind that this type of change typically face great internal resistance. Consequently, incremental and radical process configuration should be an integral part of the strategic scenarios developed by the multi-disciplinary design teams in order to gain support amongst the various systems involved.

To summarise, we argue that practitioners need to consider stabilisation operations as a complex systems which are sensitive to their initial conditions and, once deployed and thus part of a supra-system, of which

the effectiveness of the strategic model depends inherently on their ability to respond to changing environmental conditions. Accordingly, we propose that the strategic model of stabilisation operations needs to make a shift from its focus on ENDS towards one which provides ground for an inherent order that identifies and models a system's overall behaviour through adapted and acceptable WAYS. In other words, strategic modelling is subject to change.

9.3 LIMITATIONS AND FUTURE RESEARCH

We identified several limitations in this research that might offer some guidelines for future research on stabilisation operations. First, the results presented in this study are constrained by its specific context, namely stabilisation operations as a multi-actor environment. For many other research problem, that are characterised by uncertainty and involve multiple actors, potential solutions to cope more effectively with complexity may have different meanings and influences on strategic thinking of multi-actor environments. Therefore, the empirical findings of this study cannot be generalised to the many other multi-actor environments. Yet, the conceptualisation of our final co-evolutionary model might offer some ideas in regards to the strategic thinking of other types of multi-actor environments, hybrid contexts for example.

Second, this study investigates different types of uncertainty and the impact on a system's condition. In this study we selected the most mentioned factors in the interviews that caused the different types of uncertainty, namely the strategic model applied to stabilisation operations and system diversity. As there are various other factors that that could lead to the different types of uncertainty, it is possible that uncertainty could be caused by other factors than we selected for this research. Therefore, future research might pursue a similar explorative approach which aims for the identification of other factors of influence. Such findings might complement this study when it comes to the determination of the factors of influence which cause the different types of uncertainty and ultimately impact a system's condition.

Third, other limitations stem from the specific character of this study, namely addressing the so-called 'wicked problems' (Hevner et al., 2004). By applying design science we were able to gain a solid understanding of the research problem and its solution space through the development of the design artefact, namely the final conceptual model introduced in chapter 8. In this concluding chapter, we presented the key findings from the analyses of the conceptual model, developed the final conceptual model and generated final propositions. Future research may investigate these final propositions by applying them to other case studies in order to analyse their robustness. One may look into the 'charm of the skeleton' (Weijck, 2004) which refers to organisation design as bare bones framework which emerges when actors interact in their day to day situations. This 'charm of the skeleton' which finds its origin in psychology may be very useful to further explore the organisation design of stabilisation operations as complex systems.

A study that aims at investigating the complexity of multi-actor interaction during stabilisation operations should be undertaken in the operating environment where the operation itself is conducted and needs to get as close (in both time and space) to the dynamic events that take place in the operating environment. Therefore, data should be collected in the field. An important aspect to consider hereby is the difficulty of accessibility to the respected area. Consequently, for this study we selected two cases which answered to these two criteria. My position as a military officer enabled me to gain unique insights of the TFU and UN MINUSMA missions. Conversely, the same position prevented me from collecting data in local communities which is a limitation of this study.

According to Yin (2014) the suggested number of cases for a qualitative study is between four and ten. However, a small number of cases offers the potential of gaining in-depth insight into the phenomena of study (Voss et al., 2002). We believe that the through the in-depth analysis of the two case studies we were able to collect the empirical evidence for a thorough evaluation of the conceptual model. Yet, future research is needed and should be conducted in more real-life case studies as this can aid in broadening knowledge and understanding of the phenomena investigated.

The final limitation of this study is that the analysis of the conceptual model is limited to the construct level. Reflecting on Bacharach (1989), a theory "may be viewed as a system of constructs and variables" (p. 498). Hence, future research could follow up on of this study by refining the constructs into variables and generate hypotheses to explain their relationships in more detail.

9.4 CLOSURE

The first objective of this study was to examine how complexity impacts multi-actor interaction during stabilisation operations. The findings in this study suggest that uncertainty derived from the internal organisation as well as the external environment influence stabilisation operations in a non-linear fashion resulting in the dynamic equilibrium conditions of the complex system. Moreover, our study explains subsequent influences on a system's required self-organising ability to differentiate and integrate its various sub-systems, their organisational resources and competencies into condition-dependent capabilities

The second objective was to understand how information processing enables this interaction. The findings indicate that during stabilisation operations profusion of information circulate by different means amongst the actors involved. To cope with such uncertainty and ambiguity, complex systems require not only quantity but also quality of information. Additionally, conflicting interests coupled to a form of incentives to mistrust information, add complexity to the dynamic and uncertainty of stabilisation operations. Hence, information asymmetry has been identified as the second main challenge to be undertaken.

Now that we have reached the end of this study, we are confident to conclude that the emergence of condition-dependent capabilities through self-organisation is key in reaching a state of dynamic equilibrium

while processing, distributing and exchanging information. In other words, we need to consider stabilisation operations as complex systems in which the actors involved need to find their balance between order and chaos in the interoperability continuum if the challenges of future post-conflict theatres are to be successfully encountered.

Appendix

Appendix A1: List of interviewees TFU case study

TFU sub-system	Position	Reference number
TFU HQ	C-TFU	R1
TFU HQ	C-TFU	R2
TFU HQ	C-TFU	R3
TFU HQ	C-TFU	R4
TFU HQ	C-TFU	R5
TFU HQ	C-TFU	R6
TFU HQ	C-TFU	R7
TFU HQ	CivRep	R8
TFU HQ	CivRep	R9
TFU HQ	CivRep	R10
TFU HQ	C2OST	R11
TFU HQ	C2OST	R12
TFU HQ	C2OST	R13
TFU HQ	C2OST	R14
BG	C-BG	R15
BG	C-BG	R16
BG	C-BG	R17
BG	C-BG	R18
BG	C-BG	R19
PRT	C-PRT	R20
PRT	C-PRT	R21
PRT	C-PRT	R22
PRT	C-PRT	R23
PRT	CIMIC	R24
PRT	CIMIC	R25

Appendix A2: Interview protocol TFU case study

Explain people that we're working on a research about the comprehensive approach and would like to collect their opinion and expertise since they are experts in this field. In this interview we will focus particularly on the Task Force Uruzgan (TFU).

1. When have you been involved within TFU? What type of position did you have within TFU? How will you describe the nature of your responsibilities during that time frame?

2. What goals did the TFU and other organisations had?

3. What type of activities and associated resources did the Dutch government and other organisations deploy into Uruzgan province during your involvement in TFU?

4. What type of collaboration between the Dutch government and private firms was displayed within TFU? (Level of collaboration and type of relationship)

5. How efficient was the collaboration process?

6. How would you describe the decision-making processes in TFU? Do you maybe have a particular example in mind? (Strategic – tactical – operational / centralised or decentralised / network communication)

7. Were the decisions implemented efficiently in your opinion?

8. Which partner holds the decision-right in the process? (command structure)

9. What type of Information Technology or systems were involved? If any, how efficient or inefficient were those? Do you maybe have a particular example in mind?

10. Do you have anything I omit asking that you think of relevance or importance for this study?

Appendix A3: List of interviewees UN MINUSMA case study

UN MINUSMA sub-system	Position	Reference number
UN civilian staff	HoO	R1
UN civilian staff	HoO	R2
Un civilian staff	Stabilisation and recovery	R3
Un civilian staff	Stabilisation and recovery	R4
Un civilian staff	Political affairs	R5
Un civilian staff	Public information office	R6
Un civilian staff	Public information office	R7
Un civilian staff	Civil affairs	R8
Un civilian staff	Civil affairs	R9
Un civilian staff	Civil affairs	R10
UN military staff	CIMIC	R11
UN military staff	CIMIC	R12
UN military staff	CIMIC	R13
UN military staff	LNO	R14
UN military staff	LNO	R15
UN military staff	LNO	R16
UN military staff	CMI	R17
UN military staff	CMI	R18
UN military staff	ASIFU	R19
UN military staff	SOLTG	R20
UN police staff	Head of UNPOL	R21
UN police staff	Head of UNPOL	R22
UN police staff	UNPOL officer	R23
UN police staff	UNPOL officer	R24
UN police staff	UNPOL officer	R25

Appendix A4: Interview protocol UN MINUSMA case study

We are working on a research regarding the collaboration between the main stakeholders (Inter-Governmental Organizations (IGOs), Non-Governmental Organizations (NGOs), the private sector, Host Nation Government (HNG) as well as centers of influence in the local population) in peacebuilding missions. We would like to collect your opinion and expertise since you are experts in this field. This interview will focus on the situation in Mali.

1. a). Since when and for which organisation are you working in Mali?
   b). How will you describe the nature of your responsibilities?

2. a). What goals does your organisation have in Mali?
   b). b). To what extend is your organisation tending to align its own specific goals with those of MINUSMA?
   c). To what extend is your organisation tending to align its own specific goals with those of other stakeholders in the network for the benefit of the MINUSMA mission?

3. a). What type of activities and associated resources does your organisation deploy into Mali?
   b). Are there any complementary resources and capabilities in the network identified and evaluated by your organisation?

4. a). How is the collaboration between your organisation and other stakeholders (IGOs; NGOs; private sector; HNG; local centres of influence)?
   b). How is this collaboration facilitated?
   - Are there any coordination measures implemented?
   - Are there any knowledge sharing processes (regular pattern of interactions between organisations that enables the transfer, recombination or creation of specialised knowledge) between your organisation and others in the network?
   - How do you share information and coordinate activities with other organisations in the network?
   - Is there any form of governance between organisations?

5. Are there any dedicated information systems or ICT in place to facilitate the information sharing and collaboration between organisations?

6. Are there any shortcomings in those dedicated information systems? How are these shortcomings impacting your operations?

7. Do you have any other not yet discussed additions of which you believe are important for this study?

Appendix A5: List of interviewees *ex-post* reflection

Organisation	Position	Reference number
Ministry of Foreign Affairs	Directorate of Security Policy	R1
Ministry of Foreign Affairs	Directorate of Security Policy	R2
Ministry of Foreign Affairs	Directorate of Security Policy	R3
Ministry of Defence	Directorate of Operations	R4
Ministry of Defence	Directorate of Operations	R5

Appendix A6: Example of a coded interview

Red = fact
Blue = opinion/believes
Yellow = attitude [+] [-] [N]
Green = incidents

January 31, 2016
Paul Snyder
Chief J9 CIMIC (SHQ-E)

1. a). Since when and for which organization are you working in Mali?
I am the chief G9 for SHQ-E.

b). How will you describe the nature of your responsibilities?

I am responsible for Civil-Military Coordination (CIMIC) which is assist with the security of the force by engaging with the local population, finding out exactly what their concerns and issues are, supporting the force in doing what they need to do, and informing the local population in what is going on. Secondly, we are working with the civilian agencies, those of MINUSMA, NGO's, IGO's and making sure you provide them support, especially the UN civilian staff to accomplish their mission. So if they need for example security support I coordinate that with the G3 operations and G2 intelligence and provide that support.

2. a). What goals does your organization have in Mali?
The Force Commander puts out his quarterly guidance and the C-SHQ-E adjusts it then for his region. I take that adjusted guidance , specifically the CIMIC guidelines for me to follow and I develop a plan, which is usually a plan with four lines of operation. **(1)** The first line is CIMIC operations like QIP's and projects in areas of interest, the second one is coordination with civilians, the third one is information operations which means while we're out there conducting operations trying to find out if there is support for our mandate, support from the local population, and if there's not find out why is not and see how to support that. It also means messaging, sending messages out to the local population for which we have the Public Information Office (PIO). We work with them to broadcast positive things MINUSMA is doing to the local population. The last one is education. Education the population on what CIMIC is, both on the civilian side of MINUSMA because they are unfamiliar with CIMIC and the military and then train CIMIC officers. **(2)** Since we have a very small staff (we have three CIMIC officers working here) which means most of the time we have two people out in the field conducting missions. And then the end state of that is just to slowly increase the capacity, the number of QIP's, the amount of coordination, increase the training on CIMIC and at the end let the local people understand what we can do in their region. **(3)**

The problem, however, is that CIMIC is a nice to have for the forces. There's no general appreciation because CIMIC isn't easily measurable especially in these type of environments. **(4)** [-] I don't have the resources and the forces don't have the knowledge, [-] this is about the training piece of it, to get to the point where we are conducting a QIP and doing studies beforehand to see how things went before we did it and then study it six months after to find

out what true impact that had on the community, positive or negative. So there's no follow up, it's very in the moment and things can come from Force HQ to adjust the focus. **(5)**

So in quarterly guidance too, it can change the focus area. I do for example a QIP in a certain area because that's the focus area, then the next quarterly guidance comes out, and they shift focus, we're stuck in that region on that project because it may take upwards almost a year to get it through the whole process. This can create some issues on CIMIC engagement. **(6)**

Another problem [-] is the fact that most UN civilian employees work with minimal a two year contract and sometimes try to be here for three years depending on their mission. So there's not an urgency and they can take a long slow development approach to it and unfortunately since my focus area is security and helping the security of the force it creates conflict since the two go hand in hand. **(7)** They don't understand the security situation changes and if we don't react now the situation can go out of control . They don't change their paths and are not very flexible unless the SRSG steps in and says we need to change focus. [-] **(8)**

b). To what extend is your organization tending to align its own specific goals with those of other actors?

We have two meetings with UN OCHA. **(9)** We have the monthly UN OCHA coordination meeting. This is where all the representatives for NGO's, IGO's as well as the UN civilian agencies and UNPOL get together and discuss. **(10)** Issues will be brought up regarding the force or if there are friction points with the force all the way down the lowest level where a NGO in Menaka didn't see any patrols happen form Niger battalion and now they do not as safe as they did before. Then they reach out to the UN OCHA chair here in Gao and she brings it up in this coordination meeting. This is also a place where I de-conflict projects **(11)**, so I will tell them what we're doing in the region and these are the projects that we plan to propose because I need bine from UN OCHA table members, UN OCHA chair, UNPOL, so if they say "yes, this is a good project" and nobody objects we are going to construct a sports field here. So we also need to de-conflict there. It's a good meeting for all the agencies to de-conflict activities and built some kind of a long-term plan for development. **(12)**

We also have the monthly security meeting which deals specifically with issues of security. **(13)** We talk for example about the security of the airfield here in Gao. It's an effective coordination mechanism for the civilians to get their message out but I don't think it's an effective coordination method for having a joint plan, like a military action plan for the region. [-] It brings us together, it gets us talking, issues are brought up and discussed but nothing actionable because the next meeting is something new. The intent is to create a Unity of Effort but to me it's more like de-confliction right now and I can explain why that is: [-] most of the direction and guidance in this mission comes from F-HQ, I mean UN MINUSMA HQ in Bamako, so the SRSG. So most of these UN civilian agencies each have their personal mandate, instructions of how they supposed to do things. This means they get focused on what they're working on and they don't want anyone else interrupt them with working on this. They simply want to do a project or go to a certain area themselves, they don't want another civilian agency to go with them, they don't want any military personnel. They just want us to provide security and they want us to show them where to go and then they want to conduct the mission because that's where they're going to be paid for, they want to show results and if they share that they lose some control over it, have to share the results with another agency, so it makes it difficult for these agencies to share. [-] **(14)**

3. a). What type of activities and associated resources does your organization deploy into Mali?

UN MINUSMA provides money for QIP's and this money is provided amongst the organization. Anybody, including the local population can request money for a QIP. **(15)** In the case of the local population it usually will be a local leader like a mayor or a governor but most of the time it goes through an organization. So they can submit a QIP to the Stabilization and Recovery section and then there's a long process. [-] You submit a QIP, get all the paperwork together including invoices, costs, validity for what you're doing and take the photos on the initial visit. Then it comes in front of the resource committee which has five members (Head of Office, UNPOL, Chief CIMIC, Chief Civil Affairs and Chief Stabilization and Recovery) who each have a vote. **(16)** Once approved by the committee the request goes up to FHQ and once they agree the QIP can be executed. For SHQ-E there is 1 million US $ available. The committee together with UN OCHA decides which agency is most suitable for executing it. **(17**

b). Are there any complementary resources and capabilities in the network identified and evaluated by your organization?

I worked with the Dutch Civil-Military Interaction (CMI) section of the ISR-coy and the civil advisor of the HOO. Some governments bring their own funding sometimes. The Netherlands brought the Dutch Stability Initiative (DSI) funds which belongs to the Ministry of Foreign Affairs. These are small projects under € 5000 apiece. So I talked to the Dutch and asked them if they would support any potential project that we identify. A QIP can take 9 months to a year while DSI can be done in a month. It was decided we could use this tool as well. **(18)**

4. a). How is the collaboration between your organization and other actors?

We usually don't communicate with NGO's because they want no direct dealings with the military. [-] **(19)** This is being done through UN OCHA of the HOO. There are no hostilities between us but there is no actual collaboration. When we meet them in the field we do talk to each other. The only time we are having issues with them is when we are doing something they don't like. For example having a project in an village or city where they intended to do something. [-] **(20)**

We work a lot with the HOO and PIO when it comes to working here in Gao. At the moment we are sitting down with the district chiefs (chef du quartier) here in Gao once a week and give them an information briefing on CIMIC and what we can provide to them. Most of the interaction we are having with the local population is when we are doing projects or village assessments. We then sit down with the city council, the mayor, the governor and have discussions on what their concerns are in the region. We also interact with the implementing partner of a project. So if for example a local business gets the project we deal with them directly. **(21)** Occasionally, we get a request from the UN OPS or UN OCHA for us to help with certain issues they're having but most of the time we only communicate and don't actually collaborate.

Are there any knowledge sharing processes (regular pattern of interactions between organizations that enables the transfer, recombination or creation of specialized knowledge) between your organization and others in the network?

The first month we were here we did a CIMIC training in coordination with Stability and Recovery. The training was about implementing QIP's. We took an officer from every unit, each battalion and company, and basically learned them how to be a CIMIC officer, how to do this business, how to do QIP's, how to recommend QIP's to us. This makes them our eyes and ears on the ground. So if we need to do some coordination we don't necessarily have to go through the operational process. We can simply pick up the phone and call the trained CIMIC officer and this persons now knows what we are talking about. **(22)**

How do you share information and coordinate activities with other organizations in the network?

We share information with the J3's of the battalions by phone. We get direct emails and calls from the different commanders. We handle requests from the J2; J4 and J5 as well regarding CIMIC support. **(23)**

Regarding systems there is no general system with access for most actors. **(24)** If you have a system it us usually self-contained. We have for example information on the Menaka area for our engagements, we have our own information on who the local leaders are. Information, especially regarding people (like phone numbers) we don't share. However, I do share this information with the G2 and ASIFU. There is no joint system for the civilian side that are compatible to ours. These are military only. **(25)** This is a huge shortcoming. [-] The biggest shortcoming for being a civil affairs person and normally having all the assets the US is bringing to the mission like Psyops, IO is the fact that there is nothing here. [-] There is only one information officer in all UN MINUSMA and he is in the U5. Here the information comes from public affairs, and normally this is for PR, and if you split into the command support and information outreach to the population the UN is more interested in supporting the command by saying look at all this great stuff we're doing in the Gao region or look what human rights did instead of outreach to the community and try to counter for example terrorist armed groups or messaging to the local population by radio. [-] It's all focused on public affairs so they write articles and do radio broadcasting, they're not active and offensive information campaigners or psychological operations people. I do know that the French TF Barkhane has that capability. This means that we do CIMIC and then the PIO needs to broadcast the message that we have or write the article for the governors paper. We don't have that resources ourselves.

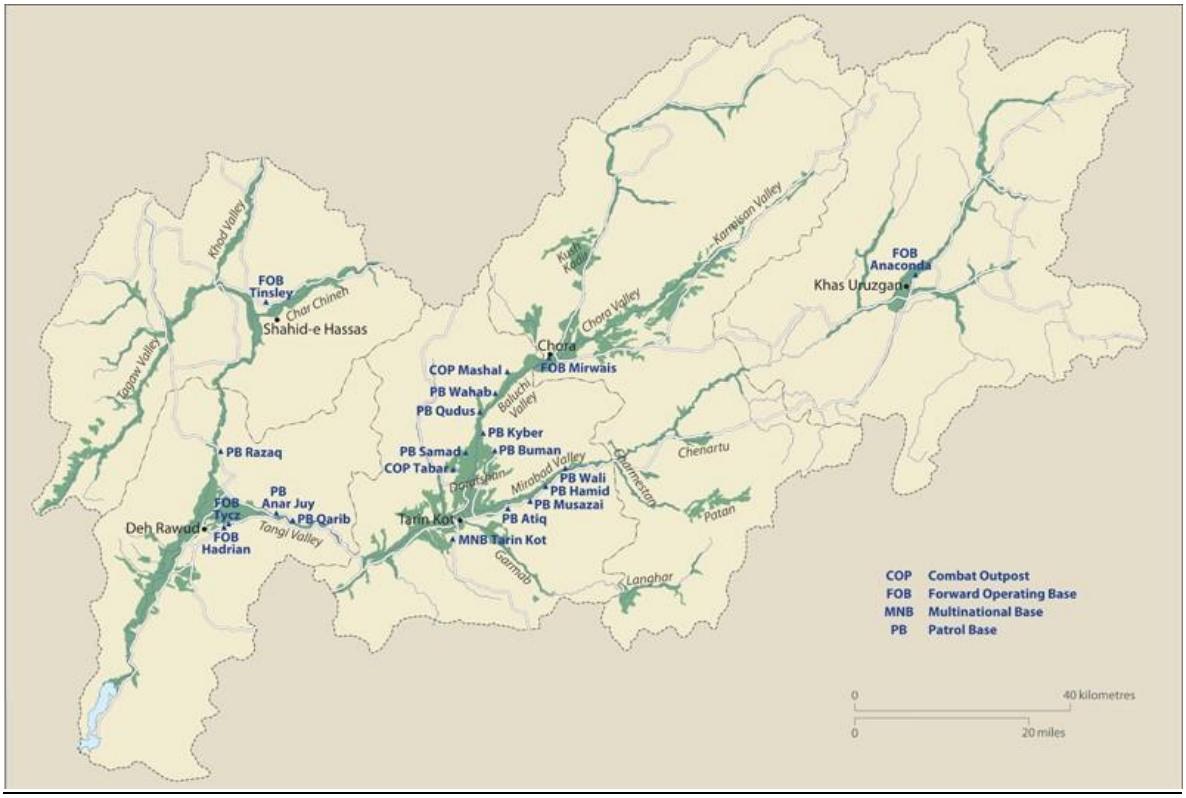
Do you have any other not yet discussed additions of which you believe are important for this study?

Appendix A7: Example of a coding table

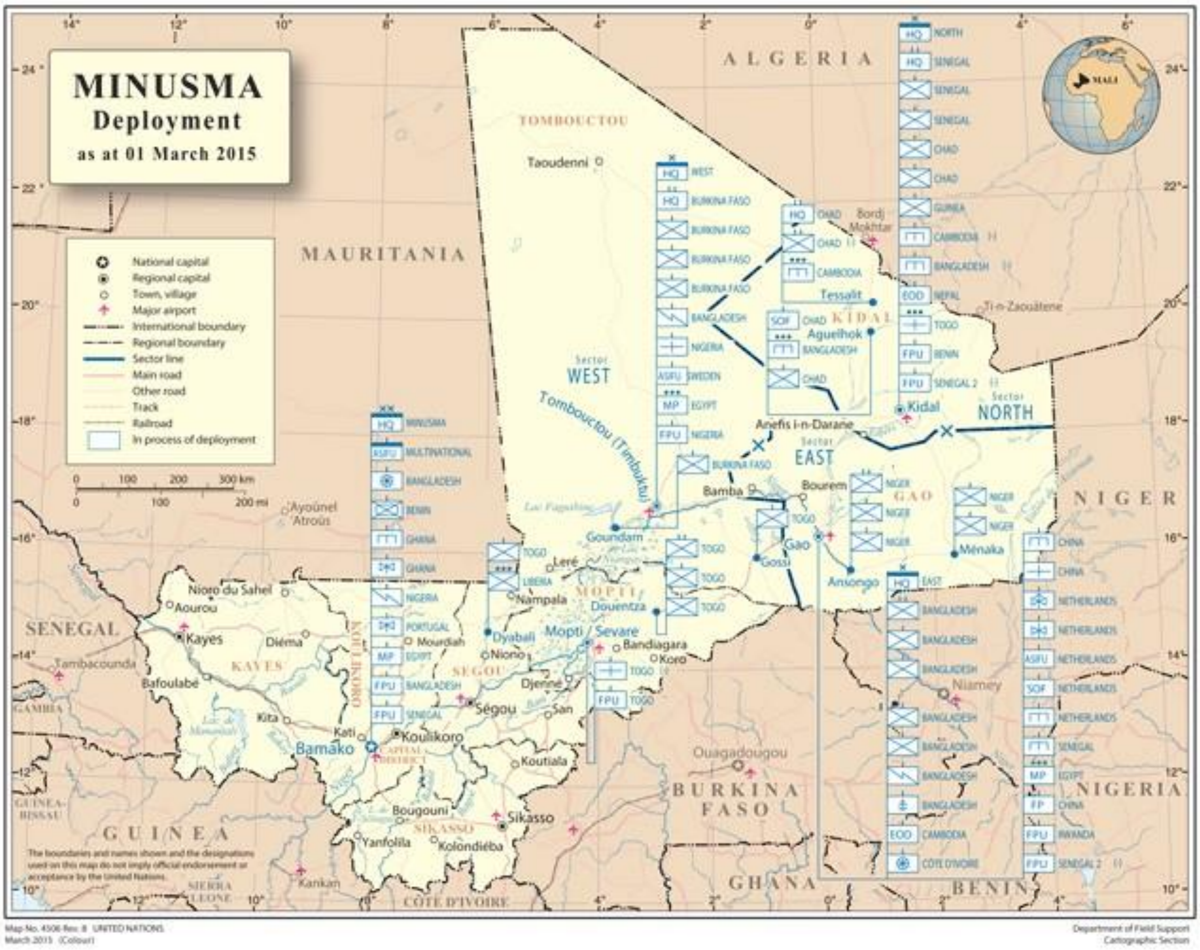
Interpersonal orientation	Communication	Relation-specific assets	Knowledge sharing routines	Complemetary resources	Governance	Network diversity	Shared authority	Trust and woking relationships
You try to identify the best partner whether one of our substantive programs within MINUSMA, or the G9 or UNPOL or through UN OCHA. The bottom line is who is the best partner to go into that area and do the work. (7); It's not enough to come as an expat into an area that you barely know or get to know, you must get to love it. You must to see the people, talk with them, shake hands and listen. Most of all listen. (9); We are at the point now that people are knocking on our door and showing interest in what MINUSMA is doing. Especially from the NGO world. (18); Some international NGO's who according to their raison d'être are humanitarian and therefore should not be seen anywhere near someone in uniform or an organization that is involved with the military [-]. But we have managed to show enough success that they by now understand that all three pillars of which I talked about are equally important and that if any of	It's not enough to come as an expat into an area that you barely know or get to know, you must get to love it. You must to see the people, talk with them, shake hands and listen. Most of all listen. (9); For example, coordination is needed between several competing agencies and NGO's. There has been some cases where the same project was undertaken by different NGO's or different agencies. That situation could have been easily mitigated when it had been properly coordinated and discussed either at the PRC level to oversee that duplication of effort [-]. It took an intervention on my part to mitigate that to make sure it became quality control, it was no quality assurance but quality control where that other agency would limit itself to certain activities and I would comprehend with the rest. It caused duplication of effort, it caused time wasted and it caused money wasted as well. (16); Everything being done is coordinated with the local government. (23); Using email is a bit difficult since not all of them are online or using one generic address to send it to and you're not sure the person on the other end is reading your message. So email is still	You try to identify the best partner whether one of our substantive programs within MINUSMA, or the G9 or UNPOL or through UN OCHA. The bottom line is who is the best partner to go into that area and do the work. (7); So if you want to meet that person face to face it requires for me for instance a security escort obviously. So I went to Ansongo recently and had nearly 30 – 40 people with me, three APC's, that's one mechanized platoon, one EOD section following at the back, there was my vehicle with a driver and a 2nd vehicle with close protection. So when I move I move with around 40 people in order to facilitate the movement from point A to B safely. This is a huge drain on the resources, the military resources of the mission because this is just me [-]. (32)	So therefore we need to work as consultants to them, we have to work in a consultative manner where everything is done through a committee and we want them to steer that committee [+]. (28); But of course we don't want to distribute that randomly and we don't want, to a certain extent, take responsibility for who should get a solar panel and who should not. So we are getting involved with the local authorities, the local government and created a committee on how and to whom the solar panels were going to be distributed to. So you have in that committee the mayors of the different circles, you have the conseil régional, the economic and financial advisor to the governor. (29)	We have three specific funding mechanism: the Quick Impact Projects (QIP), the trust fund and the peacebuilding fund which is coming directly from New York and is implemented through a coordinator placed in Bamako. (11); So we need to show unity in our approach and the level of cooperation, but also complementarity with OCHA and all the humanitarian organizations for who OCHA is overarching (20); So the NGO's who were very reluctant to deal with us in the past [-] are now willing to come and work with us. Some are even willing to implement one of our trust fund projects despite the core philosophy of the organization which says not to deal with any military components or DPKO. And the constitution of that organization even prevents them from accepting money from DPKO. They can accept money from WFP or UNICEF or UNHCR or other UNCT agencies but not DPKO. But they were still willing to work with us saying we can funnel money through WFP or OCHA and from them they will then accept the money. So we have now humanitarian NGO's who will go that far while six months ago	You try to identify the best partner whether one of our substantive programs within MINUSMA, or the G9 or UNPOL or through UN OCHA. The bottom line is who is the best partner to go into that area and do the work. (7); Six are already approved by the Project Review Committee (PRC) which is a bit like a steering committee. Ideally it should be a committee which maintain a degree of quality assurance in the implementation of projects. I don't think we have reached that level yet [-]. We are still in the quality control stage where we wait for a crisis to happen to finally react, or we wait for a shortage in funding to finally react. That committee, to my personal opinion, needs to move towards quality assurance instead of being busy with mitigating and quality control [-]. (15); You have to be careful that unity doesn't become duplication. Working together means that everybody knows his area of responsibility within that unit. It's a bit like a military section or platoon where	Within the MINUSMA SHQ-E we work with the different substantive programs such as civil affairs, human rights, public information office, culture and environment, elections and so on and so forth. You also have now in the military segment or component the G3 and G9 with who we are in close contact. (3); So to do that there has to be a strategic approach which consist of three main elements: you have the civilian component, the military component and a third component which are all the civilian international NGO's and other UN country team agencies such as UNDP, WFP, UNICEF, UNHCR an so on. There are several more. So I talked loosely of the cooperation within MINUSMA but there's a great cooperation outside the MINUSMA circle and in there is the special relationship we have with ASIFU. So there's an important dimension there as well which strategically is essential. (5); So the NGO's who were very reluctant to deal with us in the past [-] are now willing to come and work with us. Some are even willing to implement one	For example, coordination is needed between several competing agencies and NGO's. There has been some cases where the same project was undertaken by different NGO's or different agencies. That situation could have been easily mitigated when it had been properly coordinated and discussed either at the PRC level to oversee that duplication of effort [-]. It took an intervention on my part to mitigate that to make sure it became quality control, it was no quality assurance but quality control where that other agency would limit itself to certain activities and I would comprehend with the rest. It caused duplication of effort, it caused time wasted and it caused money wasted as well. (16); Everything being done is coordinated with the local government. (23); We are here to help but we are mostly here to support because it's not only a stabilization mission but also an integrated mission. So I will quote our new SRSG now: the need to support	You try to identify the best partner whether one of our substantive programs within MINUSMA, or the G9 or UNPOL or through UN OCHA. The bottom line is who is the best partner to go into that area and do the work. (7); When I pick a partner I do this with the reason to best meet the objective, or one of the five objectives. (8); The mechanisms we want to have to do that is all based on funding, all based on money. If you want to demonstrate results and acquire the trust of the community [N] we need a proportional donation of support from donating countries. (10); For example, coordination is needed between several competing agencies and NGO's. There has been some cases where the same project was undertaken by different NGO's or different agencies. That situation could have been easily mitigated when it had been properly coordinated and discussed either at the PRC level to oversee that duplication of

them faltes everyone will fall on his back [+]. (19);	weak at the moment. A lot is being done over the phone. A lot of texting. A lot of meetings face to face when we can which is sometimes difficult if you are dealing with the mayor of Ansongo or Bourem [-].		they will not give us the time of the day [-]. I like what we're doing right now and what is happening. The tree-legged approach is working and the mindset, not only the population we want to influence into reaching the five objectives of which I talked about but also the NGO's who have always been reluctant to work with the UN, especially DPKO missions, have now finally five reasons to make it work together [+/-]. (22);	everybody has its responsibility, has its arch of vision, now the moment the one starts to do the work of the other then you end up heaving friendly fire. Unity should not provide ground for duplication [+]. (17);	of our trust fund projects despite the core philosophy of the organization which says not to deal with any military components or DPKO. And the constitution of that organization even prevents them from accepting money from DPKO. They can accept money from WFP or UNICEF or UNHCR or other UNCT agencies but not DPKO. But they were still willing to work with us saying we can funnel money through WFP or OCHA and from them they will then accept the money. So we have now humanitarian NGO's who will go that far while six months ago they will not give us the time of the day [-].	them is important but proportionally they need to demonstrate what they are willing to do for themselves. (26);	effort [-].It took an intervention on my part to mitigate that to make sure it became quality control, it was no quality assurance but quality control where that other agency would limit itself to certain activities and I would comprehend with the rest. It caused duplication of effort, it caused time wasted and it caused money wasted as well. (16);

Appendix A8: Uruzgan province



Appendix A9: Mali



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